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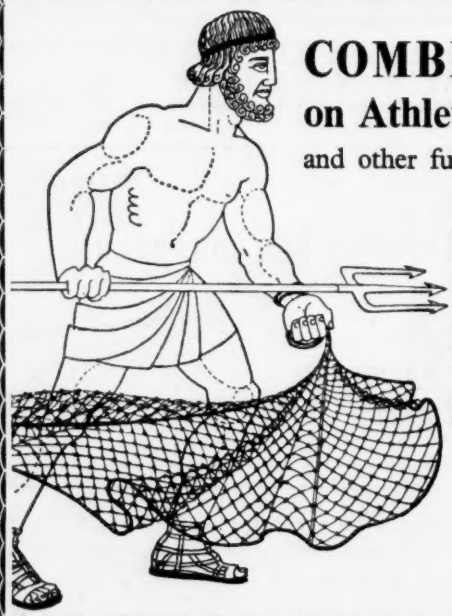

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Renal Factors in the Production of Hypertension
Prof. CLIFFORD WILSON, F.R.C.P. ... 579
(to be concluded)

Carcinoma of the Gall-bladder
LORNA COOKE, M.R.C.P.
F. AVERY JONES, F.R.C.P.
MADELINE K. KEECH, M.R.C.P. 585

Acid-base Disturbance and Potassium Depletion in some Surgical Patients
J. E. RICHARDSON, F.R.C.S.
J. R. BILLINGHURST, B.M.
D. W. VERE, M.B. ... 587

Acroparæsthesiæ in the Carpal-tunnel Syndrome
MICHAEL KREMER, F.R.C.P.
R. W. GILLIATT, M.R.C.P.
J. S. R. GOLDING, F.R.C.S.
T. GRAHAME WILSON, M.R.C.P. 590

A Pneumatic-tourniquet Test in the Carpal-tunnel Syndrome
R. W. GILLIATT, M.R.C.P.
T. GRAHAME WILSON, M.R.C.P. 595

Intestinal Cul-de-sac Phenomena in Man
J. NAISH, M.R.C.P.
W. M. CAPPER, F.R.C.S. ... 597

PRELIMINARY COMMUNICATION

The Adrenal Glands and Gingival Hyperplasia Due to Phenytoin Sodium
P. H. STAPLE, PH.D. ... 600

RECONSTRUCTION

Group Practice: What Needs to be Done
J. S. COLLINGS, M.B. ... 611

REVIEWS

Notices of Books ... 601

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents ... 618

LEADING ARTICLES

THE WAY WE WALK ... 603
ARTERIAL GRAFTING ... 604
TRANSFUSION OF BLOOD-PLATELETS ... 605

ANNOTATIONS

Civilians at War ... 606
Postvaccinal Encephalitis ... 606
"Coin" Lesions of the Lungs ... 607
Medicine and Preventive Medicine 607
Backflow in Retrograde Pyelography ... 608
The Muscles in Myasthenia Gravis 609
Physical Therapy Congress ... 609
Employment of the Disabled ... 610

Index to THE LANCET ... 610

SPECIAL ARTICLES

Armed Forces' Medical Services .. 615

OCCASIONAL SURVEY

World-wide Q Fever ... 616

LETTERS TO THE EDITOR

"Back to Front?" (Dr. Bernard Lennox; Dr. Doris Odlum) .. 619
The Reticuloses (Dr. A. H. T. Robb-Smith) ... 619
Cortisone and Corticotrophin in Blood Diseases (Dr. Mario Stefanini) ... 620
Tobacco-smoking (Dr. Lennox Johnston) ... 621
Munchausen's Syndrome (Dr. Chalmers Davidson) ... 621
Occupational Health Service (Dr. W. S. Parker) ... 621
Treatment of Regular Menorrhagia (Dr. D. T. O'Driscoll) .. 622
What is Ulcerative Colitis? (Prof. Charles Wells, F.R.C.S.) ... 622
Traumatic Rupture of the Normal Spleen in Children (Mr. G. J. Fraenkel, F.R.C.S.) ... 622
Circumcision (Dr. C. A. H. Watts; Dr. Theodore James; Dr. Samuel Miller) ... 623
Sensitivity to Phenobarbitone (Dr. I. B. Sneddon) ... 623
Glutamic Acid in Hepatic Coma (Dr. H. Weil-Malherbe) ... 623
Anæsthesia in Cardiac Disease (Dr. J. G. Bourne) ... 624
Prevention of Poliomyelitis (Dr. Margaret Agerholm) ... 624
Pain in Chronic Gastric Ulcer (Prof. G. W. Pickering, F.R.C.P.) 625

MEDICINE AND THE LAW

Drugs in the Wrong Bottle ... 626
Name Removed from Medical Lists ... 626

PUBLIC HEALTH

Poliomyelitis ... 626

OBITUARY

Bernard Sangster Simmonds 627

NOTES AND NEWS

Amputation Stumps ... 627
Excerpta Medica ... 627
Hostel for Deaf Children ... 627

University of London ... 628
Royal Faculty of Physicians and Surgeons of Glasgow ... 628
Royal College of Obstetricians and Gynæcologists ... 628
London Hospital Medical College 628
Royal Institute of Public Health and Hygiene ... 628
Society of Apothecaries of London 628
Medical Society for the Study of Venereal Diseases ... 628
Chadwick Trust ... 628
Meetings of W.H.O. Committees 628
Royal Appointment ... 628
London Hospital ... 628
Society for Cultural Relations with the U.S.S.R. ... 628
Medical Officers of the London Amateur Boxing Association .. 628

Appointments ... 626
Births, Marriages, and Deaths ... 628

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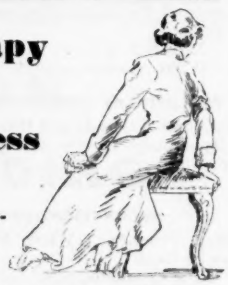

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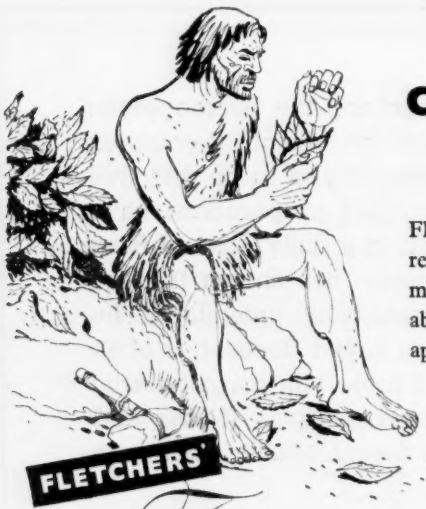

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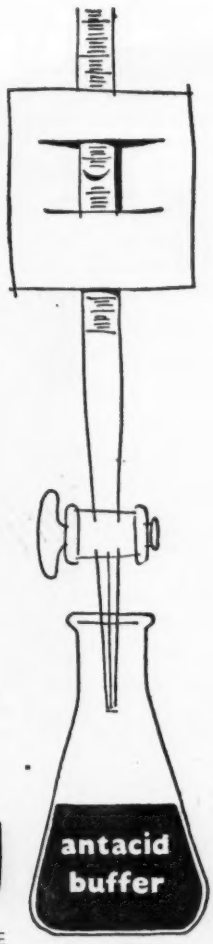

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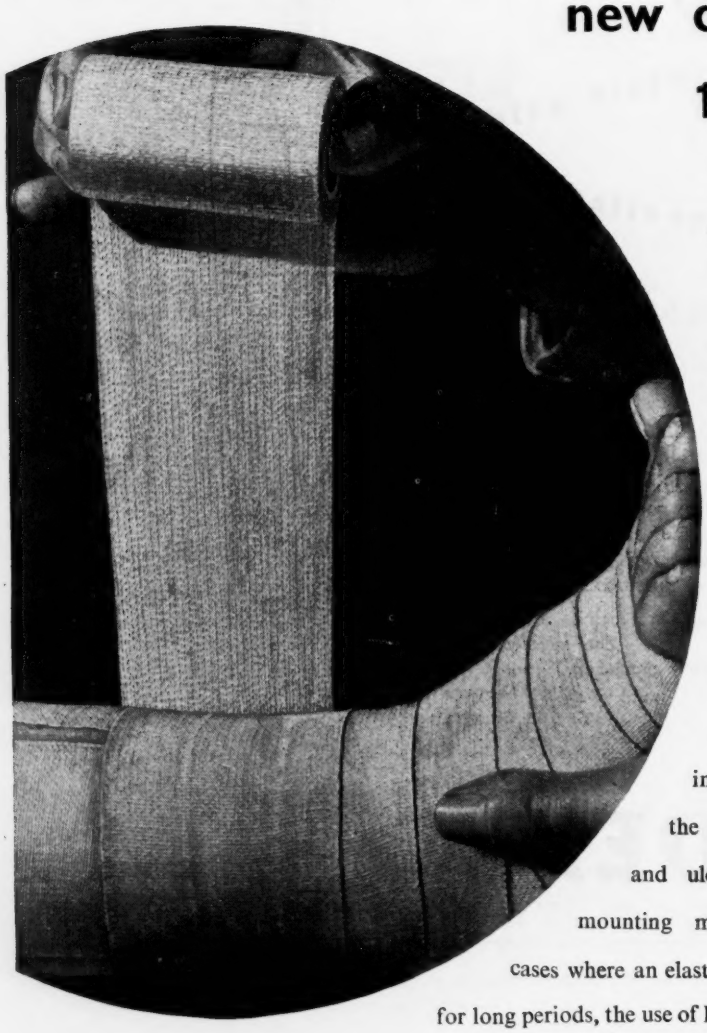

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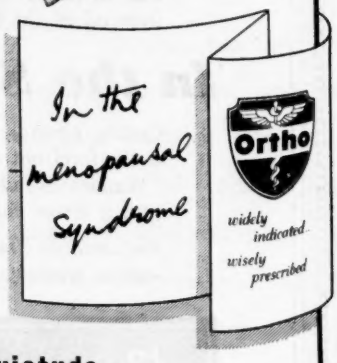

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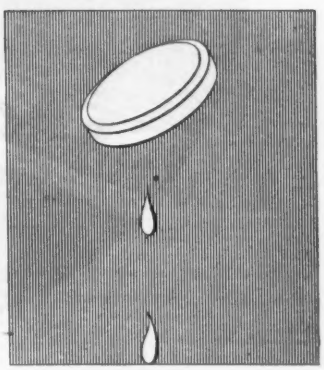
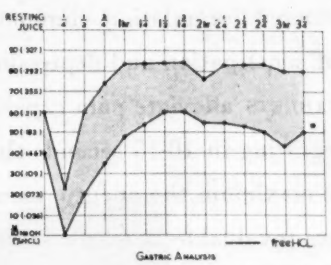
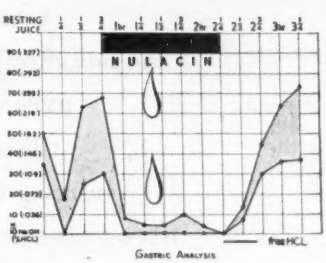




Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

REFERENCES: *British Medical Journal*, 180-182, 26*th July*, 1952
Medical Press, 195-199, 27*th February*, 1952

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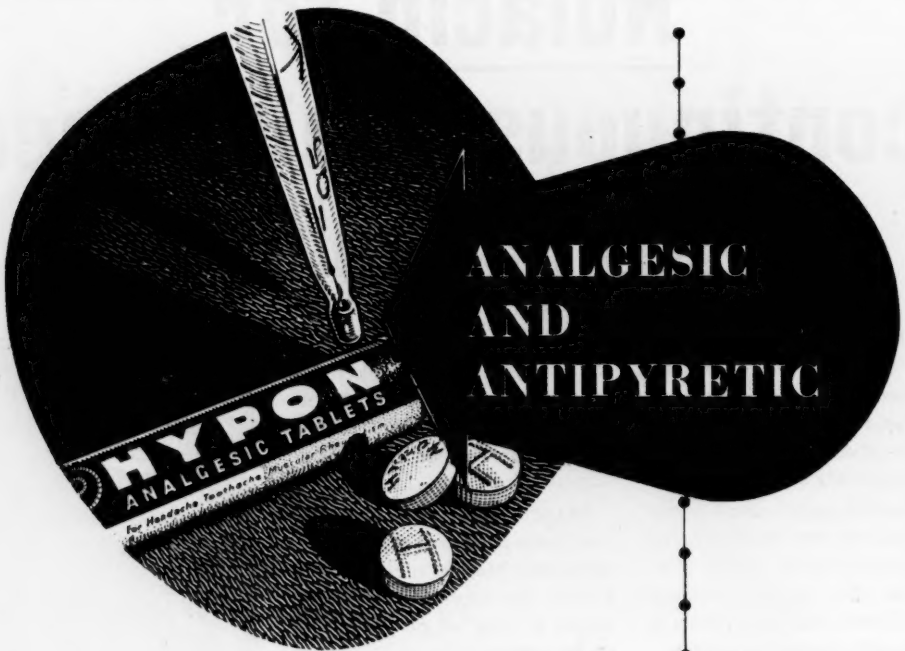

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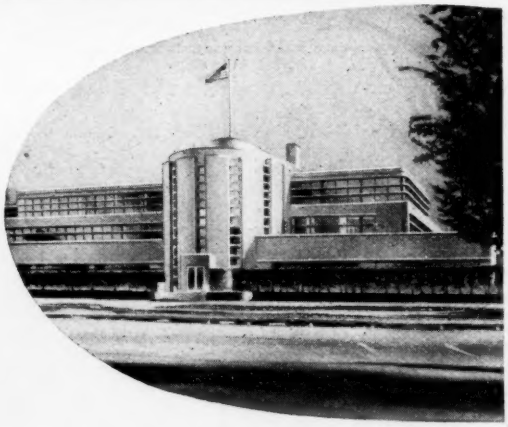

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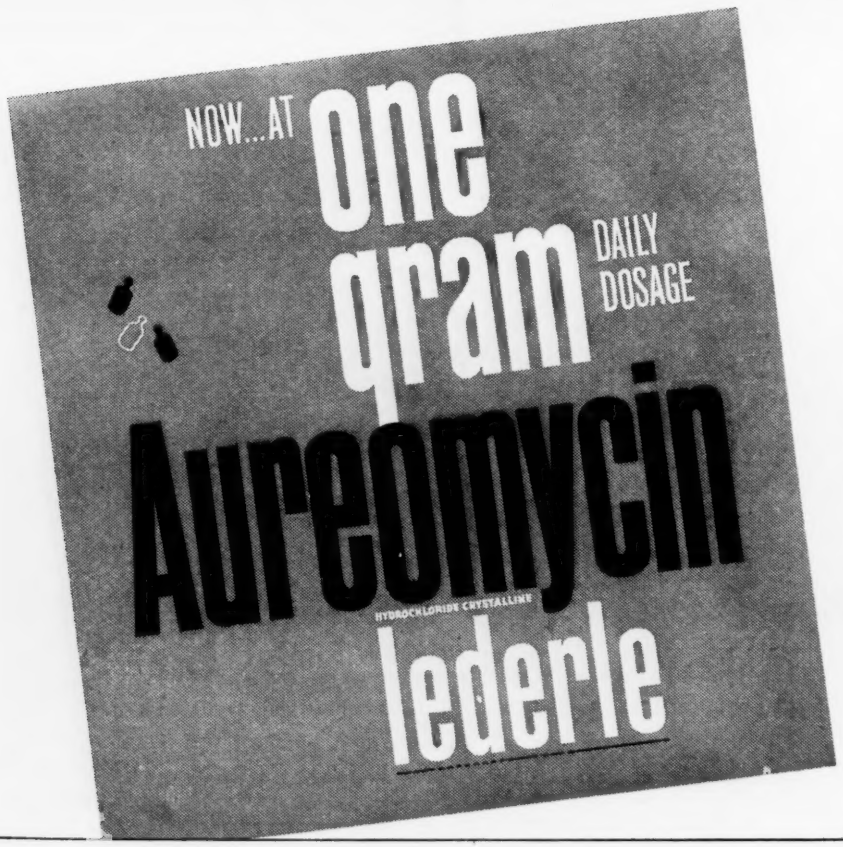

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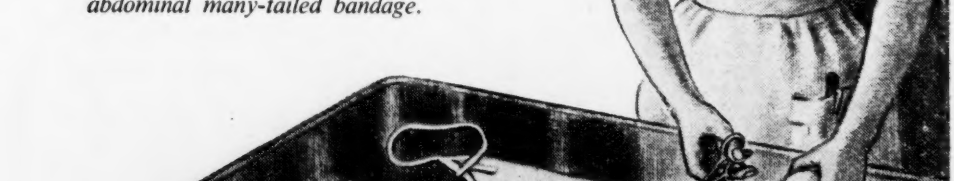
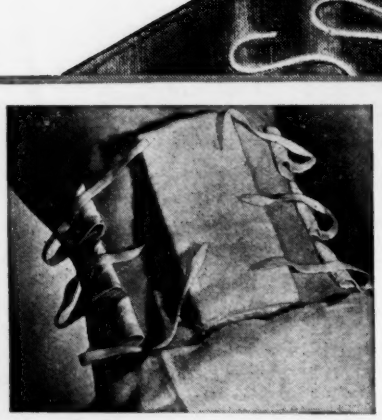
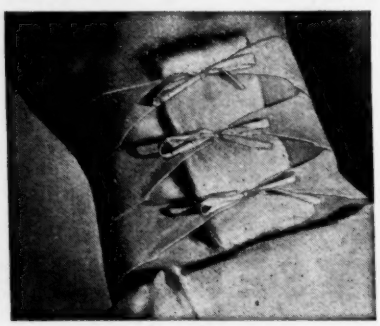




Above: Fig. 1 *Below: Fig. 2*



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RENAL FACTORS IN THE PRODUCTION OF HYPERTENSION *

CLIFFORD WILSON
M.A., D.M. Oxfd, F.R.C.P.

PROFESSOR OF MEDICINE, UNIVERSITY OF LONDON ; DIRECTOR OF THE MEDICAL UNIT, THE LONDON HOSPITAL

THE subject of these lectures is at present one of the most popular topics for research and one of the most controversial in clinical application. There are two major difficulties in presenting the problem in a satisfying and coherent manner. In the first place we do not understand how the normal blood-pressure is regulated, and in the second place investigation of the altered function of the kidney in disease is still technically difficult and uncertain in interpretation. We are becoming increasingly aware that the kidney is not merely an excretory organ, fashioned on simple lines for the elimination of waste products, but a highly complex structure which acts as the chief executive organ in the maintenance of the internal environment of the body—the so-called homœostatic mechanism. As such, its blood-flow is equivalent to one-third of the heart's output and some of its metabolic functions are under the direct control of the endocrine system, in particular the pituitary gland and the adrenal cortex. Since renal disease so commonly leads to high blood-pressure it is pertinent to ask whether the control of this basic function may not be included in the homœostatic rôle of the kidney. The results of recent research have added a note of expectancy if not of assurance to this inquiry. It is in the nature of the problem that experimental investigation of the relationship of the kidney to high blood-pressure has been conducted almost entirely in animals. Most experiments have been based on crude manipulations of the kidneys and other organs reminiscent of the techniques which in the past revealed so dramatically the physiological functions of the endocrine glands. It is not surprising that the interpretation of results and their translation into the language of human disease has at times been carried out with more enthusiasm than discrimination. Nevertheless in the investigation of renal hypertension the experimental method has already been profitable and may well lead us to the heart of the problem of the physiological control of the blood-pressure.

Any discussion on the relationship of the kidney to high blood-pressure must start with a reference to Richard Bright's original observations. In 1827 Bright described the syndrome of dropsy and albuminous urine associated with diseased kidneys. Nine years later (Bright 1836) he reported the clinical and post-mortem findings in 100 cases and noted the frequency of hypertrophy of the heart unassociated with valvular disease. In explanation he put forward the suggestion "either that the altered quality of the blood affords irregular and unwonted stimulus to the organ immediately ; or that it so affects the minute and capillary circulation, as to render greater action necessary to force the blood through the distant divisions of the vascular system." Few observations in clinical medicine have shown such objectivity as these, and I hope that in my presentation of this subject I can achieve something of this quality. But I am not over-confident, for the problem has hardly been simplified with the passage of time but has become more complex and difficult as knowledge has accumulated. A few matters may have been clarified but many new facts have posed fresh problems, and if Bright were with us today and were to express his views on the reason for cardiac hypertrophy in renal disease I think he might well repeat his original explanation without modifying the words or the emphasis.

Following the discovery of renin by Tigerstedt and Bergmann in 1898 remarkably little progress was made in the investigation of renal hypertension until 1934 when Goldblatt and his colleagues introduced a technique for the production of high blood-pressure in animals. The demonstration that constriction of the renal arteries in the dog gave rise to sustained hypertension not only provided a remarkable stimulus to further research but also laid the foundation for the experimental study of the relationship between kidney disease and high blood-pressure. Many other forms of manipulation of the kidneys have subsequently been employed to raise the blood-pressure in animals, with varying degrees of effectiveness, and these are fully described by Braun-Menendez and his colleagues (1946). Partial constriction of the renal arteries is still, however, the most satisfactory technique. Hypertension of considerable severity can be produced more certainly and more regularly by this method than by any other, and it has the added advantage that structural damage to the kidney substance can be avoided. In the course of these lectures I shall use the terms experimental renal hypertension, or "renal ischæmia" hypertension when referring to high blood-pressure induced in animals by the technique of partial constriction of the renal artery. We have, however, no clear conception of the nature of the change in renal hæmodynamics which results from renal-artery constriction.

My main purpose is to review some of the work which has been carried out, particularly during the last ten years, and to attempt the difficult task of applying the knowledge which has been gained to the problems of hypertensive renal disease in man. We may usefully subdivide the subject under three main headings :

1. Investigations on the humoral basis of hypertension, particularly the search for a renal pressor substance.

2. Studies on the course of experimental hypertension in animals by modifications and extensions of Goldblatt's experiment.

3. The relationship of anatomical lesions in the kidney to the development of hypertension in its various forms.

Investigations on the first and third of these topics have been carried out both in animals with experimental hypertension and in patients with renal and essential hypertension. Before examining the evidence I must emphasise the need for the greatest caution in interpreting experimental data. There are several reasons why difficulties have arisen and why mistakes have been made which have obscured rather than clarified the problem before us. These are as follows :

1. The results of animal experimentation have been too readily and uncritically applied to the problems of human disease.

2. Well-established facts about human disease—both in its clinical and histological manifestations—have been ignored by experimentalists and have had to be re-discovered before fallacies were recognised and corrected.

3. A multiplicity of techniques for producing experimental hypertension has been employed in different species of animals. Whilst it is remarkable how much the results of these procedures have in common, there are important species differences in behaviour. For example, the rat differs from other animals (and resembles man) in that sustained hypertension may be produced by unilateral renal damage ; furthermore, acute vascular lesions develop more readily in the rat than in other animals (including man) ; different strains of rats exhibit important differences in response to experimental procedures, so that without careful selection of strain and strict experimental control interpretation is hazardous and a comparison of the observations of different workers may be misleading.

* The first Oliver-Sharpey lecture for 1953, delivered before the Royal College of Physicians of London on March 10. The second lecture will appear in a subsequent issue.

4. In the search for pressor substances, repeated attempts have been made to analyse the physiological properties of impure substances or even "active principles" which have not been isolated and whose chemical nature is unknown. Varying techniques of biological assay have been employed, and some of these bear a very uncertain relationship to conditions in the intact animal, in which it appears increasingly likely that high blood-pressure is an integrated response of the whole organism.

I believe that certain valuable facts have been established and that a few valid conclusions can be drawn from animal investigations, but I am so impressed with the need for separating experimental results from their application to human disease that I shall deal first with the problems of experimental hypertension, and later I shall attempt to assess the significance of these findings in relation to hypertensive disease in man.

Search for a Renal Pressor Substance

Once a technique had been established for the experimental production of sustained hypertension in animals, the first and obvious problem was to decide whether this type of high blood-pressure had a neurogenic or humoral mechanism. It was very soon demonstrated that denervation of the kidney (Page 1935) or even transplantation of the kidney from its normal site (Blalock and Levy 1937) did not prevent the establishment of hypertension following renal artery constriction; and on the efferent side extensive sympathectomy was likewise ineffective in preventing or abolishing the rise in blood pressure (Freeman and Page 1937). These experiments seemed to exclude a neurogenic mechanism, and an intensive search for a renal pressor substance was begun—a search which after fifteen years is still continuing. The early work in this field has been described by Pickering (1943), and I shall make only brief reference to it. The obvious starting-point of this inquiry was the pressor substance renin, extracted by Tigerstedt and Bergmann from the renal cortex of normal rabbits. The application of modern techniques quickly revealed that renin was an enzyme which produced its pressor effect not directly, but by reacting with a plasma-globulin (hypertensinogen) to produce a new vasoconstrictor substance (hypertensin). Evidence was then sought in support of the view that the renin mechanism could supply the basis for experimental renal hypertension. In the first place, circulatory responses, in both the heart and peripheral vessels, to injections of renin or hypertensin were found to resemble very closely those produced by renal ischæmia hypertension. The critical test, however, rested on the demonstration of increased activity of the renin mechanism in hypertension. The situation was complicated by the fact that hypertensin, a polypeptide, is rapidly destroyed by proteolytic enzymes which have a wide distribution in the body. Moreover, since the chemical composition of both renin and hypertensin is unknown, indirect methods of biological assay of these substances have had to be employed. Early results were encouraging in that an increase in renin-like activity was found in extracts of the kidneys, in both rabbits and dogs, after complete or partial occlusion of the renal artery. It appeared, however, that this over-production of renin was short-lived, and all attempts to demonstrate the same phenomenon in the ischæmic kidneys of animals with chronic hypertension have failed. Similar results have been obtained from estimation of the renin content of the circulating blood. There appears to be an increase in circulating renin after renal-artery constriction (Dell'Oro and Braun-Menendez 1942), but this is observed only during the first few weeks (Haynes and Dexter 1947). Gollan et al. (1948) claimed that small amounts of hypertensin can be demonstrated in the blood of hypertensive dogs up to three months after clamping the renal artery. Kahn and co-workers (1950), using a continuous dialysis technique, demonstrated a hypertensin-like pressor substance in the blood of some normal dogs and an increased amount in dogs with severe acute hypertension. These are only a few of the many contributions on this subject, but it is clear that attempts to demonstrate increased activity of the renin mechanism in chronic experimental hypertension have been so far unrewarding. In 1950 Blacket et al. maintained hypertension for up to eighteen days in rabbits by continuous infusion of renin, and concluded that the features of this pressor response supported the view that renin was responsible for the development of acute hypertension; they were of the opinion that a change in mechanism occurred after high blood-pressure was established. Drury and his colleagues have shown, however, that if rabbits with experimental renal hypertension are given repeated injections of renin so as to induce tachyphyllaxis—i.e., a state of unresponsiveness to further injections—the hypertension is not abolished. This observation holds for both acute and chronic hypertension (Taggart and Drury 1940, Flasher and Drury 1950).

A possible alternative explanation for the increase in renin production after renal-artery constriction is suggested by the observation of Hamilton and Collins (1942), confirmed by other workers, that a renin-like substance apparently of renal origin appears in the blood in hæmorrhagic shock. It may be therefore that renin formation is stimulated by any sudden reduction in renal blood-flow and is primarily concerned with the physiological response of the body to a fall in blood-pressure rather than with the hypertensive response to renal ischæmia. I think that the time-relations may be of significance here, for all investigators are agreed that increased renin production follows promptly after renal-artery constriction, whereas renal hypertension, in our experience and that of others, may take from one to twenty-eight days to develop. At the present time the most cogent argument in favour of the renin hypothesis is that the mechanism undoubtedly exists and seems admirably adapted to exercise some physiological influence on the blood-pressure. This influence could well be exercised in the homœostatic regulation of the blood-pressure in shock, but the verification of this hypothesis depends on more exact methods of renin assay, both biological and chemical.

In human hypertension the evidence that renin plays an ætiological rôle is even less convincing than in animal experiments. Dexter and Haynes (1944) claimed to demonstrate a raised renin content in renal venous blood (obtained by catheter) in a small series of patients with acute hypertension due to eclampsia (3 cases) or acute nephritis (1 case); negative results were obtained in patients with chronic hypertension. A further series of 12 patients, including 2 cases of malignant hypertension and 1 of acute nephritis, also yielded negative results (Haynes et al. 1947). It would be unjustifiable to maintain that failure to demonstrate the active principle in the blood excludes the possibility that hypertension is due to a renal pressor substance; the humoral basis of thyrotoxicosis was accepted long before thyroid-hormone activity was identified in the peripheral blood. But if the alleged increase in renin formation is accepted as evidence of its ætiological rôle in *acute* hypertension, the absence of any such increase in *chronic* hypertensive states must indicate that some other mechanism operates in these conditions.

Increasing doubts about the validity of the renin hypothesis have led to the search for, and discovery of, a variety of other pressor or "vaso-active" substances in experimental hypertension. I do not feel, however, that their relationship to hypertension either in animals or in man has been sufficiently well established to justify any detailed reference to them in these lectures.

Studies in Experimental Hypertension

I pass now to the main topic of my first lecture and the chief source of such physiological evidence as we possess on the rôle of the kidney in hypertension. In the main, experiments have been performed on dogs, rabbits, or rats. I have already mentioned some *differences in response* to experimental procedures in different species of animals. In our laboratory we have during the past fifteen years (with an unfortunate break during the war) studied experimental hypertension in albino rats of Wistar strain by the method of renal-artery constriction with a metal clip, recording blood-pressures by the tail plethysmograph introduced by Byrom and Wilson (1938), or in unanæsthetised rats by the photo-electric cell technique on the foot devised by Kersten et al. (1947). We are fortunate in having at our disposal rats from a large and long-established colony which show remarkable uniformity of response to experimental procedures. Extensive surveys of these animals have failed to reveal spontaneous renal or vascular lesions. In a series of 600 rats recently investigated, blood-pressures have exceeded 145 mm. Hg in only 2 instances. I emphasise these points since many workers with rats report the common incidence of spontaneous renal or vascular disease. In the early experiments undertaken by Dr. Frank Byrom and myself we were able to demonstrate various aspects of hypertensive behaviour in which the rat differed from other animals, such as the dog and the rabbit, but closely resembled man. It was found, for example, that partial occlusion of one renal artery (the opposite kidney remaining intact) resulted in most instances in persistent hypertension; when the blood-pressure rose to a high level a state of encephalopathy often developed in the absence of uræmia and was relieved by removal of the ischæmic kidney; hypertension due to unilateral renal ischæmia led to the production of vascular lesions in the opposite kidney closely resembling those of malignant hypertension in man; in many animals, on the other hand, hypertension was sustained for long periods without giving rise to vascular damage. When to this parallelism with human hypertensive disease we add the further advantage that, by the use of a large series of animals, observations can be accurately controlled and the effects of individual variations minimised, the rat has much in its favour for the study of experimental hypertension.

ACUTE AND CHRONIC EXPERIMENTAL HYPERTENSION

I shall consider first a question which has given rise to considerable difference of opinion. Are acute and chronic experimental renal hypertension due to different mechanisms?

As a result of the reported findings of increased renin activity in acute hypertension and the negative results in chronic hypertension the idea of a dual mechanism gradually gained ground. Even though the evidence derived from renin studies may not at present be regarded as a convincing argument for a dual mechanism, various workers still accept this hypothesis on the basis of other experimental findings. These largely turn around the fact that in some animals chronic hypertension may persist after removal of an ischæmic kidney. Since these observations appear to me to have an important bearing on the genesis of renal hypertension, I shall discuss this aspect of the problem in some detail.

Goldblatt's original experiments demonstrated that partial constriction of both renal arteries led to sustained hypertension. If the constriction was moderate in degree the animals continued in good health without evidence of renal insufficiency, and histological examination of the kidneys showed little or no evidence of renal damage. A greater degree of constriction led to death of the animals in uræmia, usually with a severe degree of hypertension. Unilateral renal-artery constriction in the dog, with rare exceptions, produced only transient hypertension, and excision of the ischæmic kidney restored the blood-pressure to normal within twenty-four hours. The reversibility of *chronic* hypertension was, however, more problematical. Since in the dog and the rabbit chronic hypertension could be produced with certainty only by clamping both renal arteries or by constricting one renal artery and removing the other kidney, it was impossible to investigate the effect of excising the ischæmic kidney without producing a rapidly fatal uræmia. Wilson and Byrom (1939) discovered, however, that in the rat sustained hypertension resulted from constriction of one renal artery without disturbing the opposite kidney. They later demonstrated that although removal of the ischæmic kidney was in some cases followed by restoration of the blood-pressure to normal, in the majority of rats with chronic hypertension of severe degree removal of the ischæmic kidney either did not lower the blood-pressure or produced a fall to a lower but still hypertensive level. This residual hypertension they attributed to vascular damage, which was regularly found in the opposite kidney and which was regarded as a direct result of the hypertension, since no such lesions were observed in the clamped kidney (Wilson and Byrom 1941). The persistence of hypertension after removal of an ischæmic kidney has been confirmed in rats (Friedman et al. 1941, Patton et al. 1943) and in rabbits (Grollman 1944, Flasher and Drury 1949). Nevertheless there remained some doubt as to the correct explanation of this phenomenon, and the lack of evidence of increased renin activity in chronic hypertension led some observers to search for an extrarenal mechanism. Reed et al. (1944) found that in the rat acute and chronic hypertension differed in that the latter was abolished by sodium-pentobarbitone anæsthesia. From these and other considerations Ogden (1947) inferred that in chronic experimental hypertension an extrarenal neurogenic mechanism maintains the vasoconstriction. Flasher and Drury (1949), after observing persistent hypertension in rabbits after removal of an ischæmic kidney, also concluded that a "change of mechanism" occurs in the course of renal hypertension. Pickering (1945) produced hypertension in the rabbit by constricting one renal artery after removing the opposite kidney; he then observed that excision of the ischæmic kidney (i.e., total nephrectomy) after a short period of hypertension was followed by return of the blood-pressure to normal, whereas total nephrectomy after the blood-pressure had been raised for seven weeks or more was followed by persistent hypertension during the period of survival. The conclusion was drawn that acute and chronic hypertension in the rabbit involve different mechanisms and that an extrarenal factor operates in the chronic stage. Floyer (1951) has repeated this experiment in rats and found that hypertension of both short duration (seven to ten days) and of long duration (up to forty-six weeks) persists after total nephrectomy. I shall return to these observations later.

No further convincing evidence has been produced to support Ogden's theory of the neurogenic origin of chronic experimental renal hypertension. Byrom and Dodson in 1949 demonstrated by a most important experiment that chronic hypertension in the rat undoubtedly involves a renal mechanism and is promptly reversible. Hypertension was produced by constricting one renal artery and then removing the opposite kidney. After the blood-pressure had been elevated for twelve weeks release of the constricting clip on the renal artery was followed by restoration of the blood-pressure to normal within twelve hours; as in Wilson and Byrom's experiments, the clipped kidney was found to be free from hypertensive vascular lesions. This result was held to support the original conclusion that in the rat with one ischæmic and

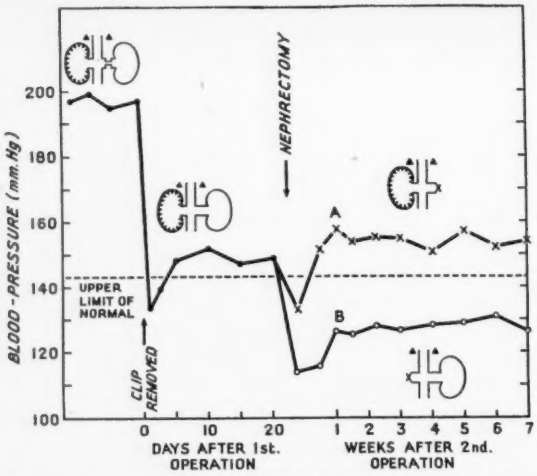

Fig. 1—Hypertension after unilateral renal-artery constriction. Effect on residual hypertension, after removing clip, of excising the unclipped kidney (A) or the opposite kidney (B) (8 rats in each group).

one untouched kidney, persistence of hypertension after removal of the ischæmic kidney is attributable to some abnormality in the remaining kidney. Further confirmation of this was obtained by Floyer (1951), who succeeded in removing the clip from the renal artery in a series of rats in which the opposite kidney had not been disturbed. In about half the animals this manœuvre was followed by persistent hypertension similar to that observed after removal of an ischæmic kidney. If now in these animals the recently unclipped kidney was excised, hypertension persisted; but if alternatively the opposite kidney was removed the blood-pressure returned to normal (fig. 1). It appears therefore that in the rat chronic hypertension which follows renal artery constriction has, like acute hypertension, a renal mechanism, and is promptly reversible. It is apparent also that the untouched kidney can itself maintain hypertension. Such untouched kidneys are not necessarily structurally normal since they usually exhibit severe hypertensive vascular damage. The correlation of physiological activity with anatomical lesions is difficult to prove, but the

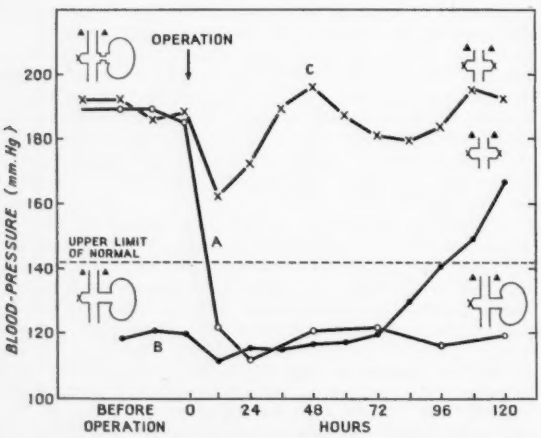

Fig. 2—Experimental renal and renoprival hypertension. A, removal of clip (7 rats) causes prompt fall in blood-pressure to normal. B, total nephrectomy in normotensive animals (10 rats); blood-pressure rises after 72 hours. C, total nephrectomy in hypertensive rat (20 animals); sustained hypertension.

significant fact is now established that unilateral renal-artery constriction, if sufficient to produce hypertension, is followed by some functional change in the opposite kidney by virtue of which it may sustain hypertension.

I conclude that, while there may possibly be some difference between the mechanism involved in the initial development of hypertension and in its maintenance, there is no question that experimental renal hypertension whether of long or short duration can be readily reversed by releasing the renal-artery constriction. The persistence of hypertension after total nephrectomy is obviously another matter, and I shall now deal with this problem, which I believe has thrown a new and important light on the genesis of renal hypertension.

HYPERTENSION AFTER TOTAL NEPHRECTOMY (RENOPRIVAL HYPERTENSION)

The occasional occurrence of slight hypertension in various animals following unilateral nephrectomy has been reported; but it is the experience of most investigators that, when spontaneous renal disease is excluded and reliable methods of blood-pressure estimation are used, removal of one kidney rarely if ever produces hypertension. During the past ten years, however, the evidence that elevation of blood-pressure follows *bilateral* nephrectomy has become well established. Before this time observations in this field were equivocal owing to the uncertainty of blood-pressure determination in animals

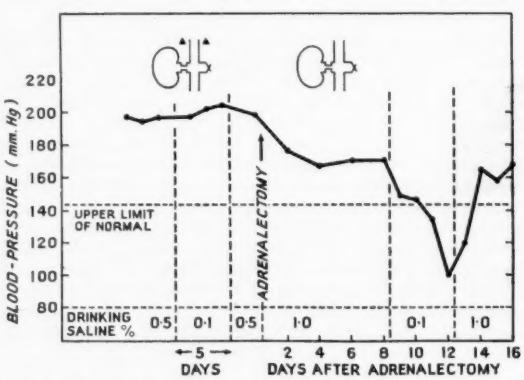

Fig. 3—Experimental renal hypertension. Effect of varying salt concentration in drinking-water on blood-pressure after adrenalectomy (7 rats).

developing uræmia. More reliable results have recently been obtained by preventing or postponing the onset of uræmia with the aid of such devices as peritoneal lavage, the use of the artificial kidney, or parabiosis. As long ago as 1910 Morpurgo carried out bilateral nephrectomy in one member of a parabiotic pair of rats and observed the development of left ventricular hypertrophy, which he attributed to high blood-pressure. The actual demonstration of hypertension in these circumstances was reported by Jeffers et al. (1940) and was confirmed by Grollman and Rule (1943). The occurrence of hypertension after total nephrectomy in single animals was reported in rats by Braun-Menendez and von Euler (1947) and was found to be more marked when the onset of uræmia was delayed by peritoneal lavage. Grollman and his colleagues (1949) made a similar observation in dogs maintained on a protein-free diet and kept alive by the use of the artificial kidney. These experiments have an obvious relevance to the persistence of experimental renal hypertension after total nephrectomy. Grollman et al. (1943) observed that hypertension produced in rats by renal encapsulation persisted after total nephrectomy, and reference has already been made

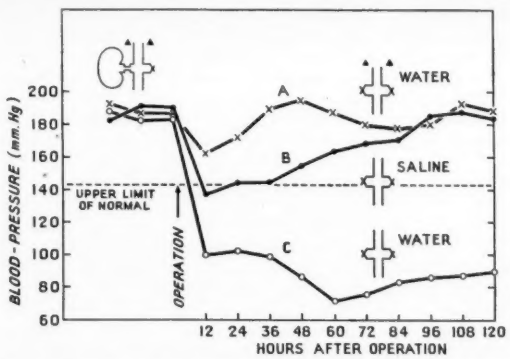

Fig. 4—Effect of nephrectomy and adrenalectomy on experimental renal hypertension. Results of total nephrectomy in animals drinking water (A, 20 rats), compared with total nephrectomy and adrenalectomy in a group drinking water (C, 12 rats), or saline (B, 10 rats).

to similar observations made by Pickering in rabbits. From these results it appeared on the one hand certain that an extrarenal factor was causing the blood-pressure to rise after total nephrectomy, and on the other hand possible that the same factor might be playing a part in experimental renal hypertension. The investigation of this possibility was of the greatest importance. During the past five years we have carried out at the London Hospital a series of experiments designed to clarify the relationship between renal hypertension and post-nephrectomy (renoprival) hypertension, and to provide information on the nature of the extrarenal factor. These investigations in single rats have been reported by Floyer (1951) and in parabiotic pairs by Ledingham (1951).

TIME-RELATIONS OF RENAL AND RENOPRIVAL HYPERTENSION

The first line of evidence was obtained from a study of the time-relations of the blood-pressure changes which followed total nephrectomy in normal and hypertensive animals. In single normotensive rats maintained on a protein-free diet and subjected to peritoneal dialysis the blood-pressure rises slowly after bilateral nephrectomy, and only after about three days rises above the upper limit of normal. A similar slow development of hypertension is seen in one member of a parabiotic pair of rats after bilateral nephrectomy in that member. Apparently therefore this interval is necessary for the extrarenal pressor factor to produce an effective rise in blood-pressure after total nephrectomy. Now, as shown by Byrom and Dodson (1949) in hypertensive rats with a sole ischæmic kidney, removal of the clip from the renal artery causes a prompt fall in blood-pressure to normal in less than twelve hours. Our own experiments have fully confirmed this observation. It follows that if renal and renoprival hypertension are caused by separate mechanisms, excision of a sole ischæmic kidney should produce a rapid fall in blood-pressure to normal followed by a slow rise in three to four days as the extrarenal pressor mechanism comes into action. In fact this experiment results in no such diphasic change but in a continuation of the hypertension with either no change in level or a slight postoperative reduction. These time-relationships are shown in fig. 2. It appears highly probable therefore that the extrarenal factor is already operating during the course of hypertension produced by renal-artery constriction.

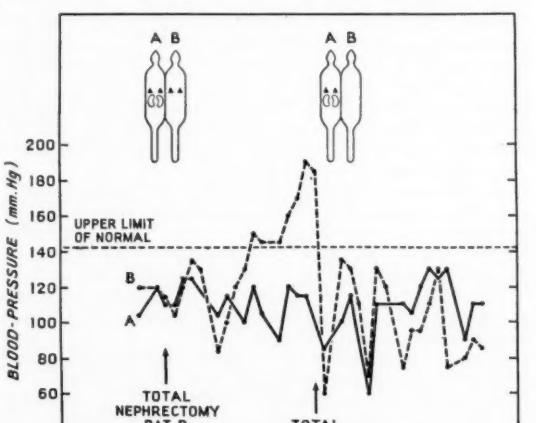

Fig. 5—Renoprival hypertension in parabiotic preparation. Effect of adrenalectomy in nephrectomised hypertensive member.

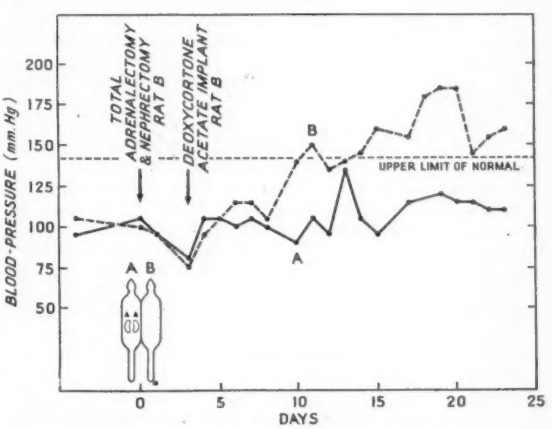

Fig. 6—Hypertension developing after implantation of deoxycortone acetate in one member of a parabiotic pair following removal of kidneys and adrenals.

The second line of evidence is derived from a closer inquiry into the nature of the extrarenal factor in both renal and renoprival hypertension, and in particular from a comparison of the effects of adrenalectomy and substitution therapy on these two forms of high blood-pressure. I shall first discuss some of the previous work which led up to these experiments.

EFFECTS OF ADRENALECTOMY AND SUBSTITUTION THERAPY ON RENAL AND RENOPRIVAL HYPERTENSION

Following the successful production of experimental renal hypertension in dogs Goldblatt (1937) found that bilateral adrenalectomy prevented the development of hypertension and that this effect was due to removal of cortical rather than medullary tissue. Page (1938) demonstrated that replacement therapy with salt and cortical extract led to the persistence of renal hypertension in a moderate degree after adrenalectomy. Similar observations were made in rats by Dell'Oro (1942), and Page et al. (1946) showed that deoxycortone acetate was to a considerable degree effective in maintaining renal hypertension in rats after adrenalectomy. Hypophysectomy was also shown to abolish renal hypertension in dogs (Page and Sweet 1936) and in rats (Leathem and Drill 1944), whilst substitution therapy with corticotrophin (A.C.T.H.) was found to maintain hypertension

after this operation (Anderson et al. 1944). Since adrenalectomy and hypophysectomy produce considerable shock and some degree of hypotension in normal animals it was not proved that these procedures necessarily bore any specific relationship to renal hypertension. The possibility subsequently arose that the depressor activity of adrenalectomy was due to deficiency of renin substrate (hypertensinogen), but this explanation rested on the validity of the renin hypothesis. When doubts were entertained about the renin mechanism, attention and investigation were diverted to the endocrine field. An undoubted stimulus leading to this diversion was the production by Selye (1942) of nephrosclerosis by combined salt and deoxycortone-acetate administration. A further factor was a revival of interest in the treatment of human hypertensive disease by restriction of salt intake. Leaving for the moment clinical studies, evidence derived from animal experiment has convincingly demonstrated that salt and deoxycortone acetate facilitate the production of various forms of hypertension, and under certain circumstances can themselves elevate the blood-pressure. In 1938 Verney and Vogt demonstrated that renal hypertension in dogs was aggravated by increasing the salt intake. Grollman and Harrison (1945) observed that restriction of sodium (as distinct from chloride) intake effectively lowered the blood-pressure of rats with experimental renal hypertension. Selye (1943) reported the production of nephrosclerosis and cardiac hypertrophy in fowls by salt intoxication, and in similar experiments hypertension was demonstrated by Lenel et al. (1948). The pressor effect of deoxycortone acetate was first established by Kuhlmann et al. (1939) in dogs and by Grollman et al. (1940) in rats. Hall and Hall (1949) showed that implantation of deoxycortone acetate in rats was followed by moderate hypertension which was somewhat increased by total nephrectomy—strongly suggesting that hypertension produced by deoxycortone is not primarily due to nephrosclerosis. The interesting observation was made by Knowlton et al. (1946) that an injection of deoxycortone acetate which had no pressor effect in normal rats produced marked hypertension in rats with serum nephritis.

Whilst these varied experiments indicated that both normal and high blood-pressure were affected by the salt hormone of the adrenal cortex, there was no clear evidence of any relationship between the renal factor, the adrenal cortex, and salt intake in the production or maintenance of experimental renal hypertension; nor had any direct comparison been made of the influence of these factors in renal and renoprival hypertension. A further series of experiments was therefore devised to investigate this problem in single rats and in parabiotic preparations. I shall now present a summary of these experiments.

I should perhaps say a few words about the parabiotic preparation. Rats of the same litter are joined three weeks after birth, and the union includes skin and muscle tissue together with the scapulæ for fixation. Such parabiotic pairs have been maintained in healthy activity for as long as two years. The circulatory connection is by a capillary anastomosis in the skin and subcutaneous tissues. The rate of circulatory exchange has been worked out by studying clearances of various substances across the union and amounts to approximately 1% of the blood volume per minute.

The results of the main experiments are shown in figs. 3 and 4 (single rats) and figs. 5 and 6 (parabiotic preparations).

EFFECT ON RENAL-ISCHÆMIA HYPERTENSION OF TOTAL ADRENALECTOMY AND SUBSTITUTION WITH SALT AND DEOXYCORTONE

As is illustrated in fig. 3, hypertension produced by renal-artery constriction is unaffected by reducing the salt content of the drinking-water to 0·1%. After total adrenalectomy the blood-pressure rapidly falls to normal levels with this degree of salt restriction but rises again if 1·0% saline is given. A similar rise follows deoxycortone-acetate implantation even though water only is given; if the deoxycortone implant is removed and 1·0% saline is substituted, hypertension persists (J. M. Ledingham, unpublished observations).

EFFECT ON RENOPRIVAL HYPERTENSION OF TOTAL ADRENALECTOMY AND SUBSTITUTION WITH SALT AND DEOXYCORTONE

The development of hypertension in single rats after total nephrectomy is shown in fig. 2 (curve B). If the adrenals and kidneys are removed together this rise does not occur. The parabiotic preparation is more suitable for this experiment than the single rat. Bilateral nephrectomy in one member causes hypertension in that member but not in its partner with intact kidneys (fig. 5). Removal of both adrenals in the nephrectomised, hypertensive member results in a prompt fall in blood-pressure to the normal level. Implantation of deoxycortone acetate will cause the blood-pressure to rise again in this preparation (fig. 6).

Hypertension produced in single rats by renal-artery constriction persists after total nephrectomy. This form of renoprival hypertension is also abolished by total adrenalectomy in rats drinking water (fig. 4, curve C), but is maintained if 1·0% saline is given (fig. 4, curve B). It has been shown that blood volume changes cannot account for the observed variations in blood-pressure in the above experiments.

The results of these investigations have demonstrated a remarkable similarity in the response of both renal hypertension and renoprival hypertension to adrenalectomy and substitution therapy; together with the observations on the time-relations of these two forms of hypertension, they appear to me to provide very strong evidence that the extrarenal pressor factor which is operative after bilateral nephrectomy is also operative in experimental hypertension due to renal-artery constriction. In my second lecture I shall consider further the nature of the extrarenal factor.

Summary

High blood-pressure can be produced in many species by manipulations of the kidney which have in common some restrictive effect on the circulation.

Renal insufficiency in the accepted sense is not a necessary prerequisite, since sustained hypertension can be produced by constricting the artery of one kidney only.

In these circumstances the opposite kidney commonly acquires an independent faculty to sustain high blood-pressure. This property is associated with, and may be due to, the development of secondary hypertensive vascular lesions in that kidney.

Experimental renal hypertension, even when of long standing, still depends on renal ischæmia and is readily reversible if the ischæmia is relieved. There is no convincing evidence that a neurogenic mechanism is responsible for this form of chronic hypertension.

The hypertension persists after total nephrectomy. It is inferred that an extrarenal factor must be operative in these circumstances.

From a study of the time-relations of the development and abolition of renal and renoprival hypertension there is reason to believe that the extrarenal factor operates also in renal hypertension and is therefore brought into play by obstruction of the renal circulation.

The presence of adrenal-gland tissue is essential for the development of both renal and renoprival hypertension. After adrenalectomy a high salt intake or administration of deoxycortone can maintain both these forms of experimental hypertension.

(*To be concluded*)

CARCINOMA OF THE GALL-BLADDER
A STATISTICAL STUDY

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IT is well established that gall-stones are found in a high proportion of patients with carcinoma of the gall-bladder, and it is generally assumed that gall-stones predispose to carcinoma; alternatively it is possible that both have a common cause. The purpose of this paper is to assess the incidence of carcinoma of the gall-bladder and consider the risk of cancer developing in a person with gall-stones.

Prevalence

There is a curious lack of agreement as to whether cancer of the gall-bladder is a common or uncommon form of cancer. In comparing figures from different countries, the possibility of a true geographical difference must always be kept in mind. The incidence is usually recorded as a percentage of all cancers, which is much preferable to the percentage based on the total number of necropsies. In the elderly it is likely that death certification is less accurate, and Jennings (1949) suggests that the male and female rates at ages 45–65 form the best data for comparisons. American workers have tended to emphasise the prevalence of cancer of the gall-bladder. Graham (1931) has been widely cited; he stated that 8–10% of all cancers arise in the gall-bladder. His estimate corresponded with the figure (9%) reported for cancer of the liver and biliary passages as a percentage of all cancers by the U.S.A. National Office of Vital Statistics. Graham argued that metastases in the liver would be recorded under the primary site (e.g., stomach or rectum) and that primary cancer of the liver was rare and therefore the majority of this group were patients with cancer of the gall-bladder. This argument may have provided a basis for a surgical attack on all damaged gall-bladders or symptomless stones, but it was unsound. Kirschbaum and Kozoll (1941), in a necropsy study from the Cook County Hospital, Chicago, found among 1808 necropsies for malignant disease 55 cases (3·0%) of cancer of the gall-bladder and 62 cases (3·4%) of cancer of the extrahepatic bile-ducts. Other American workers, however, have emphasised the rarity of carcinoma of the gall-bladder. Russell and Brown (1950) found that the 350,000 new patients who attended the Cleveland Clinic between 1932 and 1948 included only 29 in which carcinoma of the gall-bladder was discovered at operation. The time taken to collect series of cases (see table III) suggests that this really is a rare disorder. In Great Britain, Illingworth (1935) reported 36 cases of it among 1275 necropsies of malignant disease at Edinburgh. There is a difficulty about comparing hospital and national figures, since problem cases (which would particularly include patients with carcinoma of the gall-bladder) would tend to be concentrated in the medical centres, which would provide an unduly high incidence. To study this point further, the statistics have been studied from the Registrar-General and from two London hospitals.

* Working with a grant from the Medical Research Council.

TABLE I—CARCINOMA OF GALL-BLADDER, BILE-DUCTS, AND LIVER FOUND AT NECROPSY AT TWO LONDON HOSPITALS IN 1941–50 AND 1947–51, AND REPORTED BY THE REGISTRAR-GENERAL IN ENGLAND AND WALES IN 1946

Primary site	Two London hospitals				England and Wales, 1946			
	M	F	Total	% of all cancers	M	F	Total	% of all cancers
All cancers	..	..	1730	..	..	..	75,407	..
Carcinoma of gall-bladder	8	7	15	0·87	200	457	657	0·87
Carcinoma of bile-ducts	15	16	31	1·79	75	68	143	0·19
Primary cancer of liver	..	..	23	1·33	..	..	1847	2·40
Cancer of liver and biliary passages	..	..	69	3·99	..	..	2647	3·50

FINDINGS FOR ENGLAND AND WALES

At our request, the Registrar-General has specially subdivided the figures for carcinoma of gall-bladder and of bile-ducts in England and Wales, which are published jointly in his annual reports. For comparison with these figures, an individual examination has been made of each necropsy record at the Postgraduate Medical School, Hammersmith, over the ten years 1941–50, and at the Central Middlesex Hospital over the five years 1947–51 (table I).

TABLE II—SEX RATIO OF CASES OF CARCINOMA OF GALL-BLADDER FOUND AT NECROPSY AT FOUR LONDON HOSPITALS, REPORTED BY THE REGISTRAR-GENERAL FOR ENGLAND AND WALES IN THE YEAR 1943, AND FOUND AT THE MAYO CLINIC IN THE YEARS 1907–40

—	Sex	
	M	F
London hospitals	12	17
England and Wales, 1943	42*	81*
Mayo Clinic, 1907–40	81	210

* Confirmed at operation or by necropsy.

It is interesting to note that the proportion of all cancers of the liver and biliary passages, expressed as a percentage of all cases of cancer, is almost identical in the hospital figures and in the Registrar-General's return, but there is a reversal of the ratio of carcinoma of the gall-bladder to carcinoma of the bile-duct. In the hospital necropsy series, bile-duct carcinoma is twice as common as carcinoma of the gall-bladder, whereas in the Registrar-General's figures carcinoma of the bile-duct is only a quarter as common as carcinoma of the gall-bladder. There can be no doubt that the hospital series is the more accurate of the two, for they are based on complete necropsy evidence. The Registrar-General's figures for 1943 (the latest year for which such information is available) showed that the diagnosis had been confirmed by necropsy or operation in 17·2% of the patients with carcinoma of the gall-bladder and in 44·0% of those with carcinoma of the bile-ducts. Carcinoma of the bile-duct is easily confused with carcinoma of the liver, and it is likely that in the Registrar-General's figures some of the bile-duct cases were included under the heading of primary carcinoma of liver. It is perfectly clear that in this country cancer of the gall-bladder accounts for less than 1% of all cases of cancer.

Sex Ratio

In view of the relatively small numbers, further data were obtained from the necropsy diagnosis registers at University College Hospital and St. Mary's Hospital.

TABLE III—INCIDENCE OF GALL-STONES ASSOCIATED WITH CARCINOMA OF THE GALL-BLADDER

Author	Country	Period of survey	Cases of carcinoma of gall-bladder	
			Total	Percentage with gall-stones
Cooper (1937)	U.S.A.	1915–35	48	79
Illingworth (1935) ..	Scotland	1918–34	50	86
Warren and Balch (1940)	U.S.A.	1898–39	50	88
Jones (1950)	Canada	1926–48	50	82
Benjamin (1948) ..	U.S.A.	1937–46	70	57
Sainburg and Garlock (1948)	U.S.A.	1933–46	75	73
Sternberg (1935) ..	Germany	..	115	78
Gray and Sharpe (1941)	U.S.A.	1907–40	291	59

These data have not been included in all the tables since not every necropsy sheet was individually checked as was done at Hammersmith Hospital and the Central Middlesex Hospital. The survey covered 2998 consecutive necropsies at University College Hospital (1935–45) and 3995 consecutive necropsies at St. Mary's Hospital (1932–48). The figures are shown in table II which also includes figures reported by the Registrar-General for England and Wales in 1943 and data from the Mayo Clinic for the years 1907–40 (Gray and Sharpe 1941).

These figures demonstrate the excess of females over males, but this excess is not so great in the English as in the American figures.

Relation of Gall-stones to Carcinoma of the Gall-bladder

The best available evidence on the relation of gall-stones to carcinoma of the gall-bladder is summarised in table III, in which the best documented series of recent years have been brought together.

In order to assess the risk of an individual with a gall-stone developing carcinoma of the gall-bladder a careful scrutiny was made of all the necropsy records at Hammersmith Hospital between 1941 and 1950. These records were chosen because they are extremely detailed and accurate. The incidence of gall-stones is shown in table IV.

The numbers of patients with gall-stones and with carcinoma of the gall-bladder are recorded by age-groups in table V, which demonstrates the high frequency among the elderly commonly noted in other series.

It will be seen that about 3% of the cases of gall-stones are associated with carcinoma of the gall-bladder.

Among the 21 cases of carcinoma with stones found at the four London hospitals, there were 3 examples of single cholesterol stones, 2 of multiple pigment stones, and 13 of multiple mixed stones; there were 3 cases of multiple stones without a comment on their nature. The numbers are small, but the general pattern did not differ from the over-all pattern of gall-stones found at Hammersmith Hospital (cholesterol 8%, pigment 23%, mixed 43%, not stated 26%). It is noteworthy that carcinoma of the gall-bladder may be found with the metabolic cholesterol or pigment stones as well as with the mixed stones, which are commonly attributed to an infective origin.

TABLE IV—AGE-DISTRIBUTION OF CASES OF GALL-STONES IN NECROPSIES AT THE HAMMERSMITH HOSPITAL, 1941–50

Age (years)	All necropsies		Gall-stones			
			No. of cases		% of total	
	M	F	M	F	M	F
Stillborn and neonatal ..	334	244	..	..	..	..
< 25 ..	112	89	..	..	..	..
25–34 ..	53	76	2	3*	2·3	5·2
35–44 ..	128	96	4	8*		
45–54 ..	298	177	5	7		
55–64 ..	459	250	21*	32*	4·6	12·8
65–74 ..	444	303	28*	46*	6·3	15·2
75 + ..	208	189	39	36*	18·75	19·0

* Gall-bladder previously removed in one case.

Clearly gall-stones are found in a high proportion of patients with carcinoma of the gall-bladder, and the incidence is much higher than among the general population of a similar age. It is certain that the stones are not produced as a result of gall-bladder dysfunction due to the carcinoma, because the prevalence of cholelithiasis in association with secondary carcinoma of the gall-bladder does not exceed the normal expectation (Rolleston and McNee 1929). The excess of female patients with carcinoma of the gall-bladder is presumably correlated with the excess of gall-stones in females.

In this series carcinoma of the gall-bladder was found at necropsy in 3% of cases of gall-stones. Carcinoma, however, is not the only risk associated with gall-stones. In analysing the necropsy records of Hammersmith, the opportunity was taken to record whether or not the presence of gall-stones had contributed to the death of the patient—for example, by producing obstructive jaundice or empyema of the gall-bladder. Looked at in this way, the gall-stones had exerted an appreciable effect. In 30 of the 231 patients with gall-stones—i.e., 1 in 8—death was the direct consequence of the stones.

TABLE V—AGE-DISTRIBUTION OF CASES OF GALL-STONES AND CARCINOMA OF GALL-BLADDER FOUND AT NECROPSY, HAMMERSMITH HOSPITAL, 1941–50

Age (years)	Gall-stones	Cancer of gall-bladder	
		With stones	Without stones
< 25 ..	..	..	..
25–34 ..	5	..	..
35–44 ..	12	..	..
45–54 ..	12	..	..
55–64 ..	53	2	..
65–74 ..	74	3	..
75 + ..	75	1	2
Total ..	231	6	2

This proportion is similar to that found in Ehnmark's (1939) excellent statistical survey from Uppsala.

In addition to the 6 patients with carcinoma of the gall-bladder with calculi, there were 8 deaths from infection of the gall-bladder, 7 deaths from obstruction by a stone, and 6 deaths as a result of operation. A review of the clinical histories of the patients with gall-stones suggested that it is impossible to forecast from the history whether the gall-stone will ultimately cause death. It is clear that only a minority of gall-stones subsequently cause difficulties. This confirms the clinical study by Comfort et al. (1948) who followed up 112 patients with "silent" gall-stones over a period of ten to twenty years; during this follow-up 30 had biliary colic and 5 developed jaundice. Cholecystectomy was performed in 24 patients, with 3 post-operative deaths. Carcinoma of the gall-bladder did not develop in any patients during this survey. On these figures, together with our own experience, it would seem reasonable to reserve surgery for patients who have developed troublesome symptoms from their gall-stones. The risk of carcinoma is not in itself sufficient reason for advocating cholecystectomy for symptomless gall-stones.

Summary

Carcinoma of the gall-bladder accounts for under 1% of all deaths from cancer in Great Britain.

Gall-stones are found in a high proportion of patients with carcinoma of the gall-bladder.

Carcinoma of the gall-bladder was found at necropsy in 3% of 231 patients in whom gall-stones were present.

Among patients in whom a gall-stone was found at necropsy, 12% had died of complications arising from the gall-stone.

The risk of carcinoma is not sufficient justification for advising cholecystectomy for symptomless gall-stones.

We wish to thank Miss B. White, B.SC., for her assistance in the analysis of the necropsy series, and we are grateful for permission to examine the necrospy records at the Central Middlesex Hospital, the Postgraduate Medical School of London, St. Mary's Hospital, and University College Hospital. We wish also to thank Dr. W. Pagel, Prof. J. H. Dible, Prof. W. D. Newcomb, and Prof. G. R. Cameron. Dr. Percy Stocks kindly supplied information from the Registrar-General's office.

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ACID-BASE DISTURBANCE AND POTASSIUM DEPLETION IN SOME SURGICAL PATIENTS

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THE two cases reported here both showed potassium depletion, with an alkalosis in one and an acidosis in the other. Both patients were treated by the surgical unit on the ordinary hospital wards.

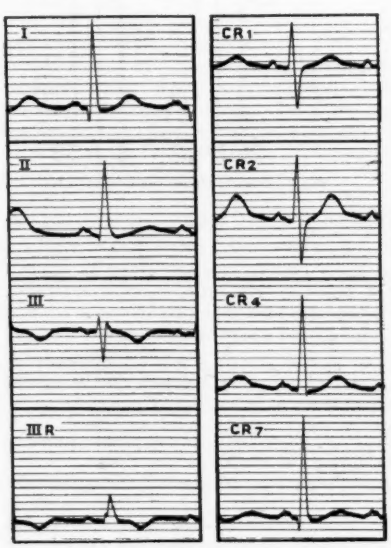

Fig. 1—Electrocardiograms in case I.

Hypokalæmic Alkalosis

CLINICAL RECORD

Case 1.—Mrs. A (L.H. 32545/49), aged 30, seven months pregnant, was admitted on Dec. 20, 1952, with acute appendicitis and peritonitis. Her appendix was removed, but some degree of ileus followed the operation.

On the second postoperative day it was noticed that the ileus was getting worse. The gastric aspirations had increased relative to the intake. By the end of the first week the patient was listless and drowsy. There was pitting œdema of the sacral pad, the fingers leaving a $^1/_4$-in. pit after ten seconds' pressure. The blood-pressure was 100/70 mm. Hg. The urine was free from protein. The abdomen was distended, being 34 in. in girth. Since operation no rectal flatus had been passed. Her mental state was not then noticed to be unusual; but, when she had recovered, it became clear that her thoughts had been extremely muddled and that emotionally she had been less stable than was normal.

Until the fifth day she received water only by mouth and 5% dextrose intravenously. As there had been no intake of potassium, it seemed likely that a deficit of this electrolyte was, at least in part, responsible for her deterioration. A blood sample was taken on the sixth postoperative day, and on the evening of the seventh day (Dec. 27) she was given 500 ml. of a solution of potassium chloride containing 40 m.eq. per litre in dextrose 5 g. per 100 ml. Next day a further 500 ml. was given intravenously, and an oral potassium mixture started, containing 0·5 g. each of acetate, bicarbonate, and citrate of potassium three times a day and providing 40 m.eq. of potassium a day (Randall et al. 1949). The clinical improvement was dramatic.

On the eighth postoperative day the abdominal distension was less, the girth being 32 in., the sacral œdema had nearly

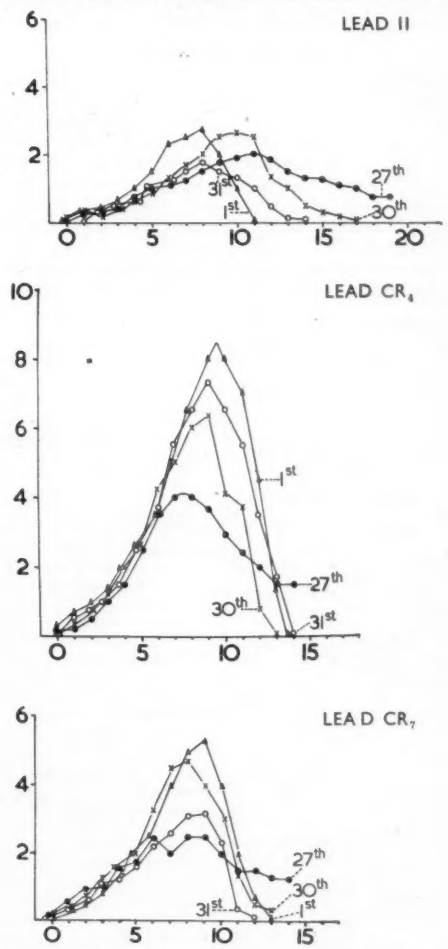

Fig. 2—T waves in case I on several postoperative days from leads indicated. Base-line is marked in fifths of a second. The ordinates represent arbitrary units of height above the isoelectric line.

TABLE I—FINDINGS IN THE BLOOD IN CASE I

Postoperative day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Potassium (m.eq. per litre)							3·3	..	..	3·5	3·7	..	3·7	..	4·8	..	..	..	..	4·8
Sodium (,, ,,)							148	..	..	150	150	..	150	..	140	..	..	..	..	145
Chloride (,, ,,)							84	85	90	90	92	..	95	..	100	..	..	..	..	..
Bicarbonate (,, ,,)							44	44	38	35	33	..	31	..	28	..	..	..	..	25
,, (ml. per 100 ml.)							82	83	76	72	70	..	68	..	63	..	..	..	..	56
Alveolar CO_2 (,, ,,)							6·8	6·7	6·5	6·3	6·0	..	6·3	..	6·1	..	..	..	..	5·9
pH							7·50	7·50	7·48	7·48	7·49	..	7·45	..	7·41	..	..	..	..	7·38
Phosphate (mg. per 100 ml.)							4·8	..	..	4	..	..	..	..	..	..	..	..	..	..
Hæmatocrit							36	39	39	40	39	..	38	..	37	..	..	..	..	35
Hæmoglobin*							70%													67%
Fluid Intake (ml.):																				
By mouth		720	390	510	660	480	630	510	750	1610	2070	1380	2520	1710	1940	(chart discontinued)				
I.V.		1200	2400	3000	5520	4200	3600	2400	..	..	..	..	..	..	..	..	..	..	..	..
Potassium intake (m.eq.)		..	..	..	..	..	..	20	22	67	77	..	..	†	†	†	†	Normal diet		
Gastric aspiration (ml.)		1228	642	394	616	494	523	194	429	(aspiration ceased)						..	..	..	..	..
Urine volume (ml.)		..	480	1320	2730	2400	1860	1620	1440	960	990	1380	1140	1650	1140	(chart discontinued)				

* 14·8 g. per 100 ml. = 100%. † Semi-solid diet with added potassium.

gone, and in the evening the patient passed flatus. On the ninth postoperative day no œdema could be detected and intestinal sounds were heard. At this time the gastric aspirations, which had been large, ceased. As the oral intake was now so satisfactory, the intravenous infusion was stopped after a litre had been given. Milk, which contains 36 m.eq. of potassium per litre, was started. On the tenth postoperative day the abdominal girth was 31½ in. and the patient had her bowels open. On the twelfth postoperative day a semi-solid diet was given, and on the fifteenth a full diet. By this time she felt well and her normal self again.

ELECTROCARDIOGRAPHY

Dr. William Evans reported: "On Dec. 27 (seventh postoperative day) electrocardiography showed a relatively low and particularly broad T wave in leads I, II, CR_2, and CR_4 (fig. 1). The T wave was low and bifid. These significant changes, suggesting an electrolytic imbalance within the myocardium, were absent from the electrocardiogram recorded three days later. The inverted T wave in leads III and IIIR was not regarded as significant."

In an attempt to compare the tracings more quantitatively the T waves on each lead were measured against finely squared paper. Points for the height of the centre of the tracing band above the base-line were plotted for every 1/5 sec. Voltages were standardised from the appropriate R waves before plotting. The magnified graphs of the T waves on successive days and from the leads which best showed the change have been superimposed in fig. 2.

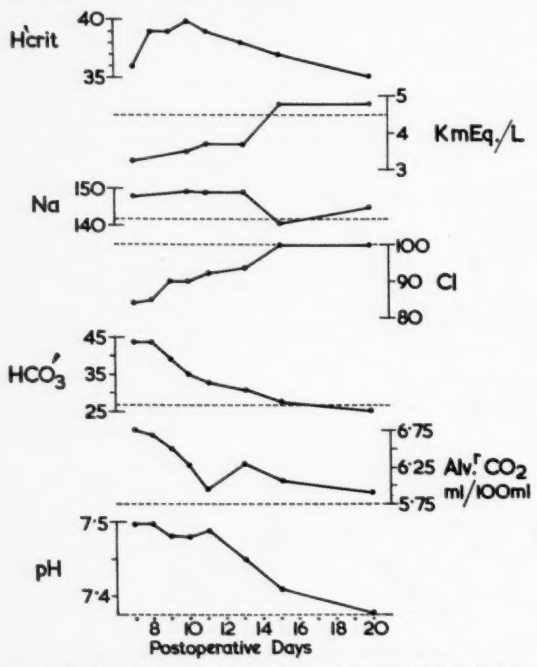

Fig. 3—Findings in case I (see table I). Interrupted lines indicate normal levels.

BIOCHEMICAL FINDINGS

To reduce diurnal variation the estimations were done at the same time each day, and the following methods were used:

(1) Plasma-potassium and plasma-sodium: flame photometer. (2) Plasma-chloride: at first Volhard's method; later by titration with mercury nitrate, using diphenyl carbazone as indicator. (3) Plasma-bicarbonate: van Slyke's method. (4) Carbon dioxide of alveolar air: a rapid micro method (Vere, unpublished). (5) Blood pH; calculated from the above by the Henderson-Hasselbalch equation. (6) Hæmatocrit. (7) Hæmoglobin. (8) Plasma-phosphorus and total plasma-protein on two occasions. (9) Blood-dextrose estimated on the first day (Folin-Wu) to determine the level maintained by the continuous intravenous dextrose.

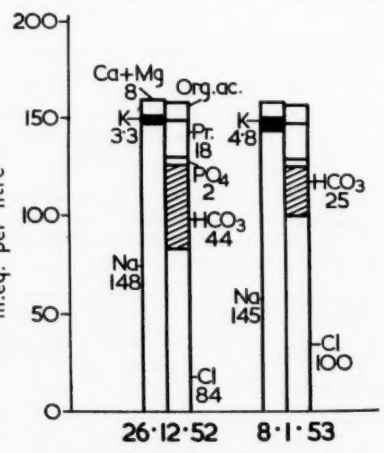

Fig. 4—Plasma-electrolytes in case I.

The values of these estimations are given in table I and shown in figs. 3 and 4. The urine volume, aspirates, and potassium intake are also included in table I. The trends may be summarised as follows:

(1) The potassium and chloride ion levels rose slowly at first for six days, and then rapidly reached normal figures during the succeeding three days.

(2) The sodium increased slightly from an already high figure during the first six days, and then fell rather suddenly to a normal figure during the succeeding three days.

(3) The blood-bicarbonate level fell steadily throughout the period.

(4) The carbon dioxide of the alveolar air fell off rather hesitantly until the sixth day of treatment, when a rapid drop to normal took place.

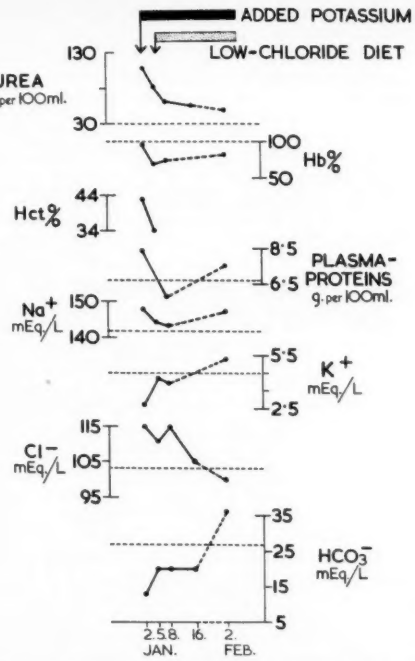

Fig. 5—Findings in case 2 (see table II). Interrupted lines indicate normal levels.

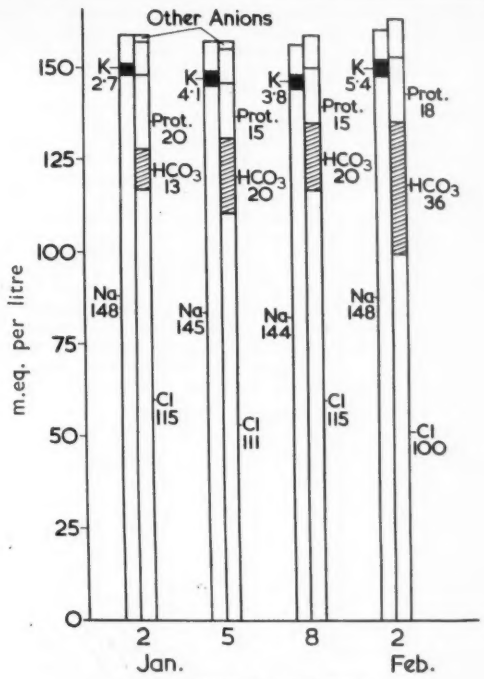

Fig. 6—Further findings in case 2.

(5) The blood pH remained high, showing very little decrease until the sixth day of treatment, when again a sudden fall to normal took place.

(6) The hæmatocrit showed a slight but definite increase during the first six days, but again on the sixth day a fall occurred to a lower level than at the commencement of treatment.

(7) The hæmoglobin, which was 70% at the time of operation, was 67% at the end of the course.

(8) Plasma-proteins, which were estimated on two occasions during the first six days of treatment as a very rough guide to extracellular fluid changes, taken in conjunction with the hæmatocrit, remained steady at 7·6 g. of total protein per 100 ml.

(9) The blood-sugar level on the first day of treatment with potassium was 100 mg. per 100 ml.

The chemical values taken as a whole show the gradual disappearance of the characteristic findings of hypokalæmic alkalosis over the period of two weeks. The correlation between trends of potassium, chloride, and bicarbonate is seen. The findings raise the following points:

(1) The serum-potassium level was not greatly lowered at first, but the patient's clinical state and the electrocardiographic tracings indicate that the depletion may have been quite severe. The serum-potassium level may be slow to reflect the grosser losses from the cells; the total body loss probably has to be quite large before the level in the serum changes significantly.

(2) The gradual rise of the serum-potassium level during the first six days of treatment with potassium followed by a rapid rise may indicate a steady replenishment of intracellular loss, which has to go on for some considerable time before the level in the serum returns to normal. This delay of six days is also reflected in the chloride and bicarbonate determinations and in the carbon dioxide of the alveolar air and in the pH. It seems likely that, in this type of case, potassium "calls the tune" where those other values are concerned, and that the body attends to the requirements of the cells before the plasma is itself replenished with electrolytes. The serial electrocardiographic tracings, which gradually returned to normal before the chemical structure of the plasma, support this idea.

TABLE II—FINDINGS IN THE BLOOD IN CASE 2

Date	Hæmoglobin (%)	Hæmatocrit (%)	Urea (mg. per 100 ml.)	Sodium (m.eq. per litre)	Potassium (m.eq. per litre)	Chloride (m.eq. per litre)	Bicarbonate (m.eq. per litre)	Plasma-proteins (g. per 100 ml.)
Jan. 2, 1953 ..	97	43	108	148	2·7	115	13	8·4
„ 5, „ ..	70	34	84	145	4·1	111	20	..
„ 8, „ ..	74	..	63	144	3·8	115	20	6·0
„ 16, „ ..	..	..	57	..	..	105	20	..
Feb. 2, „ ..	83	43	45	148	5·4	100	36	7·5

(3) Approximate indications of the changes of extracellular fluid volume may be found in the sodium levels, hæmatocrit, hæmoglobin, and plasma-protein levels. These combine to show that in the present case the extracellular compartment carried a high concentration of solids, and there was a further slight increase during the first six days' treatment with potassium. This initial increase in the solids contained in the extracellular compartment may be due to a passage of fluid from this compartment into the cells to accompany the replaced potassium.

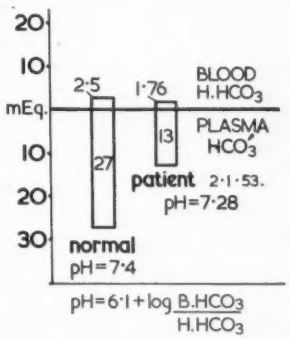

Fig. 7—Blood-bicarbonate ratio in case 2, with pH determinations from carbon dioxide of alveolar air and plasma-bicarbonate figures obtained by using the Henderson-Hasselbalch equation.

(4) After the first six days' potassium treatment there was a quick return to normal over a period of three days. An apparent rapid hæmodilution took place, showing itself in the sudden decrease in the solids of the extracellular and plasma compartments. In spite of the expansion of the extracellular space the serum-potassium level rose during this period. The nature of this sudden hæmodilution is rather obscure, but it seems to coincide with the presumed completion of cell electrolyte and water replenishment. It also coincides with the start of a full diet.

(5) The œdema was interesting, particularly in view of the finding of Black and Milne (1952) of an increase in the extracellular space in potassium deficiency. The evidence is insufficient to speculate about its cause; in the present case pregnancy may have been one of the factors. It is especially difficult to understand the œdema in view of the coincident hæmoconcentration.

(6) Some indication of the effects of potassium on the smooth muscle of the gut can be obtained from the volumes of the oral intake and gastric aspirate.

Hypokalæmic Acidosis

CLINICAL RECORD

Case 2.—Mr. B (L.H. 27765/52), a Ukrainian, aged 42, had a carcinoma of the bladder. After a preliminary bilateral ureterocolic anastomosis a total cystectomy was performed on Oct. 10: no evidence was seen of spread beyond the bladder. When discharged he was given sodium bicarbonate to take. Six weeks later he was readmitted in dehydration and acidosis. He recovered, but had to be admitted a third time on Jan. 3, 1953. He lived by himself and had eaten little in the previous fortnight. For five days before admission he had been vomiting, and on admission he was very ill and semi-comatose. His tongue and skin were dry, and there were many areas of superficial infection.

Treatment was started on the day of admission with intravenous dextrose and electrolytes, including sodium and potassium chlorides. As there was an immediate response, it was soon possible to give a mixture of citrate, bicarbonate, and acetate of potassium (Parsons et al. 1952) by mouth. The further improvement in both physical and mental condition was dramatic. The vomiting ceased, and on the third day a low-chloride diet was started. On discharge on Feb. 5 he was cheerful, coöperative, and eating well.

BIOCHEMICAL FINDINGS

These were obtained by the same methods as in case 1. The findings during his third admission—from Jan. 3 to Feb. 5—are shown in table II and figs. 5–7.

The hæmoglobin, hæmatocrit, and plasma-protein and serum-sodium levels showed there was, at the time of admission, dehydration with hæmoconcentration. During the first three days there was a rapid expansion of the extracellular space. The potassium deficiency following ureterocolic anastomosis, described by Parsons et al. (1952), was aggravated in this patient by the anorexia and vomiting.

Conclusions

Case 1 with hypokalæmic alkalosis needed treatment with potassium chloride. The metabolic findings in case 2 with hypokalæmic acidosis clearly showed the need for treating the patient with an alkaline potassium salt. At first the salt may have to be given intravenously; later, it may be taken by mouth.

The dangers of giving potassium intravenously have been emphasised (*Lancet* 1951, 1952). It should not be given unless there is a proved deficit, and until the fluid needs of the extracellular space have been corrected. This can best be judged by the urine volumes.

In both our cases the recovery was dramatic after only a little potassium had been given. The nature of this action, which seemed almost catalytic in its magnitude, is of great interest. First the mental state, then the smooth-muscle function of the intestine, then the cardiac muscle, and finally the patient's blood biochemistry returned to normal.

We wish to thank Dr. William Evans for his report on the electrocardiograms, Mr. J. P. Blandy for help in treating the cases, and Miss Patricia Archer for figs. 2–7.

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ACROPARÆSTHESIÆ IN THE CARPAL-TUNNEL SYNDROME

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THE term "acroparæsthesiæ" literally translated means merely paræsthesiæ in the extremities, but it was adopted by Schultze (1893) to denote bilateral burning pins-and-needles at night in the fingers of middle-aged women. Since, however, digital paræsthesiæ are present in many conditions, the original term was soon more diffusely applied and lost its precise significance. It remained in use, however, as a descriptive term without any real pathological or ætiological connotation. So much was this the case that Wilson (1940) omits acroparæsthesiæ as a nosological entity from his textbook and describes the syndrome in the section on cervical ribs. Walshe (1945) describes the condition under its original name but clearly feels that it would be better put into the group of compression lesions of the neuro-vascular structures in the cervico-axillary canal, and in a later paper (Walshe 1951) develops this idea still further and virtually abandons "acroparæsthesiæ" as redundant. Pritchard (1950), however, clearly separates the "acroparæsthesia syndrome" from those due to compression of the brachial plexus, and considers it to be an entity which can be distinguished on clinical grounds alone from other causes of peripheral paræsthesiæ. McArdle (1949) first suggested that the cause of this syndrome was compression of the median nerve at the wrist, and that such cases would benefit from simple division of the flexor retinaculum forming the ventral wall of the carpal tunnel.

We have followed up this suggestion and now present an analysis of 40 cases treated surgically. We agree that the "acroparæsthesia syndrome" is a definite clinical entity with features that make its diagnosis relatively simple, and our results have fully confirmed McArdle's view that such cases can be cured by local operation at the wrist.

Clinical Picture

The early manifestations are mild, and it is uncommon for the patient to be seen before the syndrome is well developed. The usual complaint is then of attacks of painful tingling in one or both hands at night, sufficient to wake the sufferer after a few hours' sleep. The pain

and paræsthesiæ are usually described as "burning" or "agonising," and a deep-seated ache may spread up the forearm to the elbow. The ache is severest on the inner aspect of the forearm and more rarely may be felt in muscles as high as the shoulder. With the pain and tingling there is a subjective feeling of uselessness in the fingers, which are sometimes described as feeling swollen; yet on inspection little or no swelling is apparent. Relief may be obtained by hanging the arm out of bed or shaking or rubbing the hand; but, as symptoms increase, the patients often get out of bed and walk about until eased. At this stage attacks of tingling may develop during the day, but the associated pain in the arm is much less common than at night. The symptoms not uncommonly disappear while the patient is on holiday, only to return with the resumption of normal work. Objective changes in sensation and power may appear in the hand, but some patients may suffer severe attacks of pain for many years without developing abnormal neurological signs.

Analysis of Cases

In the 40 cases in our series, the condition occurred five times more often in women than in men. The women were busy housewives who often did housework in the evening in addition to their daytime employment. The common age of onset was 40–50, but the youngest patient was 26 and the eldest 68. Except when associated with direct trauma, the onset was usually nocturnal and insidious, and in our series we have not found any particular change in the mode of life to explain the appearance of the symptoms. In fact patients often complained that they could no longer do the work they had done for many years. The woman who had always done all her own housework and had kept her family in clothes by sewing and mending might become afraid to go to bed after an ordinary day's work because her nights were so disturbed by attacks of pain. As diurnal paræsthesiæ increased, knitting, sewing, or even writing letters would gradually become impossible for more than a few minutes at a time.

The reference of the pricking and tingling could be determined only by taking a most careful history. Many of the patients when first seen referred the paræsthesiæ to all the digits and even the whole hand. Only by repeated inquiry into the severity in each finger separately was it possible to assess accurately the extent and spread of the tingling. It has been our usual practice to ask the patients to make accurate observations themselves between visits, and once they were familiar with the nature of the inquiry and the sort of detail required they became good observers. After a period of reflection few of them admitted to symptoms in the little finger. Only half the patients were able to localise their symptoms to digits in the median territory without this period of more accurate observation.

All 40 patients experienced pain in the hand of varying severity as the episodes of tingling and numbness became more severe. This was either described as burning, aching, pricking, or tight and bursting, or as a painful numbness felt most in the fingers and deep in the palm.

25 patients had accompanying pain in the forearm, and in half of these the pain reached the shoulder. Most of them described this as a dull aching pain felt deeply in the limb, and its intensity has been related to the severity of the pain in the hand.

Patients often said they had stiff wooden fingers on awakening and tight useless hands, and illustrated the resulting characteristic semiflexed position. The immobility, which might persist for several minutes, did not seem to be due to weakness but to a fear of using the fingers, and thus resembles the "pseudocramp" described by Lewis et al. (1931).

In addition to a subjective feeling of tightness some of the patients reported swelling of the fingers during an attack, and noticed that their rings were tight. Colour changes in the fingers were described by 5 patients, but they were not necessarily related to attacks, and we have not observed them ourselves.

27 cases in the series were bilateral, and in 26 of them the symptoms occurred first, and were more severe, in the dominant limb. The remaining 13 cases were unilateral, and in 11 of these also the dominant limb was involved. In only 8 cases was a history of local trauma obtained. In 5 the trauma was slight, but in 3 it seemed especially likely that definite local injury had precipitated the syndrome; in 2 of them painful tingling began shortly after a displaced Colles fracture of the wrist, and in the 3rd a fractured scaphoid was present. There were also 4 cases, without any history of injury, in which radiography later revealed gross arthritic changes in the carpus of the affected hand.

Although most of the cases were seen within one or two years of the onset of symptoms, 6 patients gave a history of severe tingling for more than five years, and in 1 of them the condition had been present for twenty-eight years, with only short periods of remission.

22 patients had muscle wasting of the abductor pollicis brevis and, to a lesser extent, of the opponens pollicis. This was severe in 5, moderate in 9, and slight in 8, with weakness corresponding to the degree of wasting present. Significant changes in deep reflexes were not observed.

Sensory impairment in our cases was not usually conspicuous. Previous descriptions of the "acroparæsthesia syndrome" have emphasised this point, and some workers have denied its occurrence, but in 35 of our cases some evidence of involvement of the sensory fibres of the median nerve could be detected by careful testing. Most commonly there was a mild subjective change in sensation restricted to the median fingers, firm touches being less vividly perceived on the finger pads than elsewhere, and accompanied by a transient prickle or "electric" feeling. In some cases this change was accompanied by definite hypalgesia and hypæsthesia, but this rarely involved all the three and a half digits supplied by the median nerve, or extended on to the palm.

Differential Diagnosis

In most of the cases the diagnosis presented little difficulty, the condition being easily distinguished from other causes of tingling in the fingers. Ulnar-nerve lesions, cervical-disc degeneration, disseminated sclerosis, cervical-rib syndromes, and polyneuritis may all cause digital paræsthesiæ, but the symptoms are rarely paroxysmal, and few of these patients are troubled by nocturnal pain in the fingers or the hand. Painful arthritis of the wrist and carpus did not give rise to serious diagnostic difficulty, but occasionally it was found that secondary pressure on the median nerve had resulted, and that a true acroparæsthesia syndrome was also present.

Not all our patients had radiographs of the thoracic inlet, but none suggested by either history or examination that there were bony abnormalities present. The wrists were radiographed in 27 cases, and osteo-arthritis of the carpus was revealed in 4 of them.

Compression or percussion of the anterior aspect of the wrist was used to elicit Tinel's sign, but this was present in 2 cases only.

A simple test based on transient ischæmia of the affected limb was developed (Gilliatt and Wilson 1953) and found most helpful in emphasising the sensory disturbance present.

Electromyography and sweating tests were tried in a few cases but proved too cumbersome for use in a busy outpatient clinic, and appeared to add little of diagnostic value.

Treatment

Of the 60 patients with this syndrome seen in the two years ending in September, 1952, the condition was severe enough to warrant operation in 40.

Walshe (1951) pointed out:

"That the essential element in the successful treatment is rest, and that vitamin therapy, the local application of heat and other comparable measures are not effective unless rest is also prescribed, and when it is prescribed and followed they are unnecessary."

With this we agree, but to prescribe rest is usually a counsel of perfection and in severe cases would entail indefinite immobilisation of the hands. Where the symptoms are severe enough to bring the patient to hospital, short periods of rest are generally useless, because the improvement is transient and the syndrome inevitably recurs on the resumption of former activity. We have therefore treated these patients by decompression of the median nerve at the wrist as suggested by McArdle (1951). This is a minor operation and in our hands has given consistently good results. It has the advantage of confining the patients to hospital for a day or two only, and allows them to resume all but the most strenuous activity after the first few days.

OPERATION

General anæsthesia has been used except when it has been contra-indicated by the patient's general condition. Operation under local anæsthesia is not entirely satisfactory, but has been used in conjunction with brachial-plexus block.

A pneumatic tourniquet is applied to the upper arm, and the limb exsanguinated with an Esmarch bandage. The tourniquet is inflated to well above systolic pressure, and the Esmarch bandage removed. A transverse incision 1 in. long is made along the middle third of the distal wrist crease. The skin is reflected to expose the palmaris longus tendon, which is isolated and retracted to the ulnar side. The fine transverse glistening fibres of the upwards expansion of the flexor retinaculum can then be seen. A sharp scalpel is used to cut the transverse fibres, exposing the median nerve protected by its filmy covering fascia. As soon as the nerve begins to bulge through the transverse fibres, a small pair of curved blunt-pointed scissors is insinuated through the gap in an upward direction, and the fibres are separated from the nerve. One blade of the scissors is then withdrawn, and the fibres are divided to free the proximal part of the nerve. The straight blade of a moistened Macdonald's raspatory is inserted distally between the nerve and the flexor retinaculum. When the carpal tunnel is particularly tight, the blade will only pass towards the palm for about $^1/_4$ in., even when the wrist is flexed. A sharp tenotome, ground on one side only, is next slid along the raspatory. The handle is rotated through 90° so that the blade cuts the retinaculum. The raspatory will now slip through to the palm. The tenotome is again slid superficially along the raspatory, and the remainder of the retinaculum divided. The instruments are withdrawn, and a blunt probe is passed right into the palm and raised to ensure that there is no band holding down the median nerve. The incision is sutured with interrupted silk stitches, and a pressure dressing is applied, using a 2-in. crêpe bandage. The tourniquet is released, and the fingers are inspected to ensure that the blood-flow is not impaired.

The operation takes about ten minutes. Iodine should not be used for skin preparation, because it may then be difficult to make sure whether the blood-flow has returned to the fingers. The arm is elevated for twelve hours after the operation, thus relieving the patients of any discomfort by reducing swelling of the hand. The patients are allowed to go home the day after operation, but are advised not to touch the bandage until they return a week later for the removal of stitches. Finger movements are encouraged, and the patients are permitted to do needlework or to knit.

The transverse incision along the distal skin crease of the wrist has proved most satisfactory. It leaves an almost invisible scar, allows excellent access to the upper edge of the flexor retinaculum, and, with adequate care, the whole retinaculum can be easily divided. A vertical incision would cross skin which is particularly liable to take pressure and tends to heal leaving a bad scar, but such a vertical incision may be used to expose the flexor tendons if necessary. The median nerve itself should never be disturbed, because it is likely to become adherent to the vertical incision in the flexor retinaculum.

The operation will fail to relieve pressure if the distal edge of the flexor retinaculum is not divided. If the pressure dressing is incorrectly applied, a hæmatoma may develop and give pain; but, although this is a distressing minor complication, there is little evidence that it leads to fibrosis sufficient to cause further compression of the median nerve.

Should a second operation be necessary, it is safer to use a long vertical incision extending into the palm, with full exposure of the whole of the flexor retinaculum. The possibility of damaging the median nerve, which may have become adherent to the retinaculum, is thus reduced.

RESULTS

In 37 cases operation was successful in producing immediate and permanent relief of pain. The 40 patients were re-examined at intervals after operation, the follow-up period varying from six months to two and a half years. 6 patients described a slight residual ache in the thenar muscles, which in no way resembled the previous pain. None had pain in the arm or forearm. Few of the patients with severe muscle wasting and weakness lost these manifestations within a year, but those who were less affected recovered normal power in the hand. Of 35 patients with sensory impairment 15 recovered completely; 17 showed improvement with reduction in the degree and extent of the deficit. Slight residual tingling was present in one or more fingers in 9 patients, but in all of them this subsided within a few months of operation. In only 3 patients were gross changes noted in the median nerve at operation, and in them motor and sensory recovery was slow and incomplete after a year. 37 patients were extremely pleased with the result and returned to their former occupations, and in none of them have symptoms recurred in the hand concerned.

3 of our cases must be regarded as operative failures, because re-exploration was later necessary. In 1 patient, with ten years' history of severe burning pain in the hand, the median nerve was found to be atrophic at operation; no real relief of pain resulted from division of the flexor retinaculum, and little motor or sensory improvement took place. After nine months the wrist was re-explored, with wide exposure of the nerve. No definite evidence of residual constriction of the median nerve was found, but it was again noted to be small and atrophic; subsequent improvement was slow; and, although this patient was free from pain when last seen, considerable motor and sensory impairment remained.

In 1 of our own early cases and 2 others operated on elsewhere the patients noticed little improvement in their symptoms. Re-exploration was done with wide exposure of the flexor retinaculum through a longitudinal incision extending into the palm. In all 3 cases it was found that the distal fibres of the flexor retinaculum were undivided, and the second operation produced permanent cure.

In the remaining patient in whom re-exploration was necessary, a cyst arising from the flexor tendon sheaths was found compressing the median nerve. This was resected, and permanent cure resulted.

In 5 of the bilateral cases the condition was so severe in each hand that bilateral decompression was done during one admission to hospital. In most of the cases, however, the symptoms were very much worse on one

side than the other, and in such patients a unilateral operation was preferred to start with. After operation on the worse hand it was noticed that immediate relief was achieved on the operated side, followed during the next few days or weeks by gradual subsidence of symptoms in the other hand as well. When seen postoperatively patients often commented that they could tolerate the condition in their other hand. Nocturnal paræsthesiæ were now diminished or absent, because they were using the treated hand more and were sleeping on that side at night. 8 patients, however, returned after a variable period having found that symptoms had increased again in intensity in the untreated hand with resumption of full activity. In these cases a second operation produced a permanent cure.

Illustrative Case-records

Case 1.—A right-handed housewife, aged 49, had had symptoms for two years in both hands before she was seen. She would be wakened in the early hours of the morning by burning tingling in the thumb, index, and middle and, to a lesser extent, ring fingers of both hands, the right being more severely affected. This would be accompanied by a numb swollen feeling in the fingers and by a deep ache passing up the forearm on the inner aspect and into the upper arm almost to the shoulder. This would last up to an hour, during which time she would try to rid herself of the pain, by shaking the hands or getting out of bed and walking about. Her own impression was that nothing made much difference to the pain, and that it would ease spontaneously after a certain time. The attacks were always at their worst at night but could appear in the day. When this happened, the tingling in the thumb and neighbouring fingers would precede numbness by as much as ten minutes. The precipitating factors for diurnal attacks were knitting, sewing, wringing, washing, or writing. Just before she was seen, the attacks were so severe that she was afraid to go to bed and suffered greatly from insomnia.

Examination showed slight wasting and weakness of the abductor pollicis brevis on both sides and a well-marked hypalgesia and hypæsthesia over the palmar surface of the thumb, index, middle, and half the ring fingers.

Operation and Result.—Division of the flexor retinaculum on both sides afforded immediate relief, and when seen six months later the patient reported that she was sleeping well and doing a full day's housework without difficulty; examination showed no abnormality.

Case 2.—A right-handed housewife, aged 47, had first begun to experience attacks of burning tingling in the thumb, index, and middle finger of the right hand in 1938. These were mild but would wake her in the early hours of the morning. She could obtain relief quite easily by hanging the arm out of bed and would then sleep till morning. Within the next three years the symptoms became more severe; she would have several attacks in the night which she could not relieve unless she walked about swinging and rubbing her hands. The tingling was now succeeded by a burning cramp of vice-like intensity in the hand, particularly in the thenar eminence. The fingers felt numb and swollen, though no change could be seen, and in the mornings the hands were "wooden and useless" for half an hour. About four years after the onset she began to have diurnal attacks which were precipitated by sewing, knitting, and polishing, and interfered increasingly with her housework. At no time during her illness was pain felt above the wrist. During this period she was treated by physiotherapy to the hand, arm, shoulder, and neck. She was also given by mouth and by injection every component of the vitamin-B complex alone and in various combinations until, in her own words, she "must have been a solid mass of vitamins." In 1949 she underwent subtotal hysterectomy for menorrhagia and during the month of convalescence she was free from symptoms. These returned as soon as she took up household work again. After this she was treated at intervals by manipulation of the neck by orthopædic surgeons, and by osteopaths; when this failed, she was given a course of intermittent neck traction, and then a long period of exercises designed to increase the tone and efficiency of the shoulder-girdle muscles. In 1951, being still no better, she had the costoclavicular space explored because abduction of the right arm abolished the pulse, and the right shoulder was lower than the left. One cord of the brachial plexus—probably the middle—was found to be unduly taut when the shoulder was depressed, and appeared to be hooked over a thickening of Scarpa's fascia. When this was divided the situation looked more normal. Exactly as in the previous convalescent phase, she was completely relieved for a month, only to relapse when she started working again.

On examination by one of us in June, 1952, she had slight weakness of the abductor pollicis brevis and a mild hypalgesia of the outer three and a half fingers on the palmar aspect.

Operation and Result.—Two days later the right flexor retinaculum was divided, and the patient began to do needlework as soon as the pressure bandage was removed. When seen in January, 1953, she had no symptoms in that hand, was doing all her housework, and could sleep through the night without sedation.

Case 3.—A right-handed housewife, aged 52, fell on her left wrist in November, 1951, and sustained a Colles fracture. This was reduced, a plaster cast was applied, and she remained comfortable until it was removed five weeks later. Resumption of active movements at the wrist caused pins-and-needles in the thumb, and index, middle, and ring fingers. These symptoms were especially liable to appear at night a few hours after going to bed, and she was awakened by severe pain in the affected fingers "as if they were cold and thawing out with burning pins-and-needles." Sometimes the fingers felt swollen and a burning pain spread up the arm even to the shoulder. She would hang the arm out of bed but was often forced to get up to obtain relief.

Examination.—At this stage she was seen by Mr. Philip Wiles, who found a fixed hyperextension deformity at the wrist with a 45° limitation of flexion. There was no wasting or weakness of the hand, but there was slight subjective numbness over the thumb, index, middle, and median half of the ring fingers.

Operation and Result.—Division of the flexor retinaculum in March, 1952, gave immediate relief, and when seen seven months later the patient could do her full work and had no recurrence of her symptoms.

Case 4.—A right-handed man, aged 54, manager of a leather factory, had had symptoms in both hands, the right more than the left, for four months before he was first seen in April, 1950. Nocturnal attacks of pins-and-needles in the thumb, index, and middle fingers of both hands would awaken him. He might also have severe boring pains in the hands as if he were "gripping red-hot knives," and a dull aching pain from the wrists to the shoulders. The attacks would last from a quarter of an hour to half an hour, and he was forced to get out of bed and swing the arms to get relief. As the attacks became more severe, he began to have milder attacks during the day. In the early mornings the fingers were stiff and, when they relaxed enough for him to be able to towel the forearms, he noted showers of tingling shocks in the affected fingers. The thumb, index, and middle fingers of both hands became so numb that he had to look at his fingers when doing up buttons. At this stage he was taking heavy doses of barbiturates in an unavailing effort to secure sleep.

Examination showed moderate wasting and weakness of the abductor pollicis brevis on both sides and impairment of cutaneous sensibility over the median-nerve territory in both hands.

Operation and Result.—Bilateral division of the flexor retinaculum produced immediate relief from pain and tingling, but some numbness remained for several months. When seen again eighteen months after operation, the patient said that he had returned to full work at once and had only minor attacks of pins-and-needles in the right index and middle fingers. Sleep had not been disturbed since the operation, and examination revealed no abnormal neurological signs.

Case 5.—A right-handed man, aged 60, had begun to be awakened in the early mornings in August, 1950, by attacks of burning pins-and-needles in the left hand, involving mainly the middle and index fingers, with burning pain radiating up the arm to the shoulder. Even during the day minor attacks of pins-and-needles could be precipitated by holding a newspaper or carrying a suitcase. When he was first seen in November, 1950, no abnormal neurological signs were discovered. Ischæmia of the limb, produced by a pneumatic cuff round the arm, caused a severe attack of pain in the hand and arm. During fourteen days' rest in hospital his

symptoms improved, but after discharge the attacks began again, but were much less severe than formerly. In February, 1951, his right hand became involved in a similar manner. He was often awakened by intense burning pins-and-needles in the hand and fingers and by severe pain in the arm.

Operation and Result.—By June, 1951, these attacks had become so severe that the right flexor retinaculum was divided, producing complete relief. Shortly after this date symptoms increased in severity in the left arm and hand. In December, 1951, the patient had a cardiac infarction, accompanied by typical electrocardiographic changes, which was followed by angina pectoris. For a time his attacks of pain in the left arm and hand were attributed to angina, but in April, 1952, he was referred back to the neurological department, and the left flexor retinaculum was divided. This operation was followed by immediate and permanent relief of pain in the arm and hand, although the attacks of retrosternal pain continued. Unfortunately, in September, 1951, symptoms had reappeared in the right arm and hand identical with his original attacks of pain and tingling, and continued with increasing severity over the next nine months. Examination then showed a cystic swelling above the right wrist crease. Detailed sensory examination was difficult because of the pronounced hyperpathia over the pads of the index and middle fingers.

Second Operation and Result.—In June, 1952, a second operation on the right wrist showed a synovial cyst arising from one of the flexor tendon sheaths and compressing the median nerve. It was then realised that damage to one of the tendon sheaths at the primary operation had led to the formation of this cyst and had been responsible for the unexpected return of symptoms. Removal of the cyst produced complete freedom from the attacks of pain. When the patient was seen six months later there had been no recurrence; he was sleeping well, and was extremely gratified with the result.

Discussion

Our cases confirm the view of previous workers that among the causes of paræsthesiæ in the fingers is a group that can be distinguished by characteristic clinical features. In contradistinction to other conditions producing distal paræsthesiæ, the most important clinical feature of the group under discussion seems to be the paroxysmal nocturnal nature of the attacks and their association with pain in the hand of considerable severity.

The nature of the syndrome has provoked considerable discussion for many years. Walshe (1945) has convincingly given the reasons why it cannot be regarded as a peripheral neuritis, and has concluded that it is produced mechanically by compression of the neurovascular bundle in the axillary inlet resulting from dropping of the shoulders in debilitated women. Pritchard (1950) regards the condition as an organic neurosis due to prolonged spasm of the arterial supply to the nerves, and suggests that, when this is released during sleep, the nerve becomes flushed, with the production of pain.

Our view is in accord with that first put forward by McArdle (1951), that the focal point in production of the syndrome is the median nerve as it passes through the carpal tunnel. In those patients in whom the site of the lesion was known to be at the wrist, the clinical syndrome was indistinguishable from that which occurs spontaneously. In case 5 the causal lesion was a ganglion pressing on the median nerve at the wrist. This had been produced by a previous operation on the carpal tunnel, and was not recognised until a second operation was done. In this patient there was relief, after the primary operation, for three months, followed by recurrence of exactly the same symptoms as before, and removal of the ganglion cured the condition. In case 3 a badly reduced Colles fracture produced no symptoms while the forearm and hand were in plaster, but these began as soon as the plaster was removed and movement at the wrist was resumed. Symptoms persisted for three months until the median nerve was decompressed at the wrist. In both of these patients with unequivocal lesions at the wrist, pain was present in the arm as high as the shoulder in attacks which were mainly nocturnal. These cases were indistinguishable from those with the spontaneous syndrome, and were relieved in the same manner.

In some of our cases muscular wasting and sensory impairment indicated involvement of the median nerve, and in them subjective symptoms were indistinguishable from those of patients without abnormal neurological signs. In none of the 40 cases was there any evidence of neurological abnormality outside the territory of the median nerve.

As might be expected from the view already put forward, release of the median nerve from compression at the wrist produces dramatic relief from symptoms. In 37 of our 40 cases immediate and permanent relief of pain resulted from operation. In 2 of the 3 patients in whom there was a poor result an obvious local cause for this was revealed by re-exploration, and a satisfactory result was then obtained. In the remaining patient a severe atrophic lesion of the nerve was present; but, in spite of this, gradual postoperative improvement took place, a result which we are inclined to attribute to decompression.

It might be argued that this is a benign syndrome which may remit spontaneously or resolve after rest or a change of occupation, but we do not feel that this detracts from the value of operation in severe cases, in some of which the symptoms may persist for many years and lead to permanent damage to the nerve. It is extremely gratifying that even in the most severe cases the patients have been relieved of their paroxysmal attacks of pain at once, and have been able to return to full activity within a few weeks of operation, with gradual improvement in motor and sensory function over the succeeding months.

Does the drooping shoulder play any part in the production of acroparæsthesiæ? Walshe (1945, 1951) advances the view that pressure of the neurovascular bundle against a normal first rib results from drooping of the shoulders in the debilitated overworked woman. To this he ascribes the acroparæsthesiæ. Our experience of the cervical-rib syndrome, in unequivocal cases of bony abnormality which have been cured by operation, has not shown us a case which in any way resembles the syndrome described here.

The presence in the "acroparæsthesia syndrome" of "partial thenar atrophy" (Wilson 1940) is accepted by Wilson and by Walshe as indicating a lesion at the level of the brachial plexus. Wilson explains this by a particular position of the fibres to these muscles in the cords of the plexus. Walshe finds this difficult to accept, and advances the view that these fibres can be pressed on at a point distal to the cords of the plexus—e.g., by an aneurysmal dilatation of the subclavian artery. We have not seen such a dilatation in our patients, and we agree with Brain et al. (1947) that it is extremely unlikely that partial thenar atrophy is produced by a lesion at the level of the brachial plexus. With them we find it easier to accept the wrist as the site of compression. If a lesion in the axillary inlet plays any part, we feel it can only do so by obstructing venous return and causing swelling of the limb, a possibility which is discussed below.

If we can regard the site of compression in our cases as being at the wrist, what is the mechanism of the syndrome? The very rapid disappearance of the paræsthesiæ and pain in the limb after decompression makes it reasonable to regard the lesion as transient ischæmia of the nerve. The rapid failure of sensation when further ischæmia is applied (Gilliatt and Wilson 1953) supports that view. Such a vascular lesion could be produced by an excessively narrow carpal tunnel. This could result from trauma to the radius or the carpus, disease of the tendons or their sheaths, arthritic changes in the wrist joints, or thickening of the fibrous

tissue of the flexor retinaculum itself. Obvious narrowing has been demonstrated in many cases at operation, but in others the tunnel has appeared to be of normal size and has allowed a Macdonald's raspatory to be passed into the palm of the hand without difficulty. In these latter cases transient swelling of the soft tissues in the neighbourhood of the nerve may be the precipitating factor for the attacks. In this respect it is interesting that swelling of the hands during the night was noticed by several of our patients, and it has not been uncommon for women to report that their rings were tight on waking. The predominantly nocturnal occurrence of attacks may be related to venous obstruction due to lying on the arm, and to retention of carbon dioxide during sleep, with consequent vasodilatation and increased production of tissue fluid. Muscular hypotonia during sleep may also diminish the venous return and thus increase tissue œdema. That muscular hypotonia and venous stasis are important may be inferred from the manner in which finger and hand movements are used by the patients to dispel symptoms on waking.

In a constricted and partially anoxic median nerve any increase in surrounding tissue bulk might well lead to further ischæmia and thus precipitate the syndrome. Where there is some mechanical narrowing of the tunnel, as after trauma, arthritis of the carpus, or disease of the tendon sheaths, the other causes of local ischæmia need be less severe to produce symptoms.

There is no doubt that sustained use of the hands during the day for knitting, washing, or writing often causes an exacerbation of nocturnal symptoms. Kendall (1950) has suggested that, in flexion of the wrist and fingers, the flexor tendons may exert intermittent compression on the median nerve at the wrist. Possibly some mechanism of this sort causes not only diurnal paræsthesiæ but also reactionary œdema sufficient to cause worsening of symptoms during the following night.

The relationship of endocrine changes to the syndrome is obscure. The syndrome occurs in both sexes and at most ages after early adult life; but the largest number of patients are women in the menopausal years. Possibly, therefore, endocrine disturbance plays some part in the production of the syndrome, although ordinary œstrogen replacement therapy, as used for the postmenopausal state, has no influence on its course. Whatever the endocrine disturbance may be, its effect in this syndrome appears to depend on an increase in the volume of the contents of the carpal tunnel, and symptoms are relieved by the decompression operation. Although we have not seen enough of the acroparæsthesiæ of pregnancy to be dogmatic, they appear to resemble the syndrome of median-nerve compression described above. The acroparæsthesiæ of pregnancy are probably related to endocrine changes, for they usually resolve after parturition or at the end of lactation. We have recently seen a patient (not included in this series) who had almost intolerable nocturnal burning paræsthesiæ and pain in the arm from the fifth month of pregnancy onward. At the eighth month she was completely relieved by decompression of the median nerve at the wrist. Whether the narrowing of the tunnel in pregnancy is produced by water retention or by increase in fat content we cannot say, but the rapidity of spontaneous recovery following parturition favours the former hypothesis.

Paræsthesiæ in the hand in acromegaly were first mentioned by Marie (1886) and have been ascribed to compression of the structures in the cervico-axillary canal (Behrman 1945), but Kellgren et al. (1952) have described a case in which acromegalic paræsthesiæ were relieved by division of the flexor retinaculum.

There is no doubt that compression of the median nerve at the wrist may cause not only local symptoms in the hand but also pain felt in the muscles of the arm as high as the shoulder. This is normally a poorly localised ache felt deeply in the muscles, and some patients have found relief by supporting the arm with their other hand to take its weight off the shoulder girdle.

Possibly this pain is analogous to that of cervical disc disease, which is often widely felt in muscles which receive a nerve-supply from the irritated roots. It is, for example, well known that, with lesions of the seventh cervical root, pain in the pectoral muscles may be so severe as to suggest coronary heart-disease. In the carpal-tunnel syndrome it is not improbable that pain should be felt widely in muscles supplied by the median nerve, and some support for this may be derived from the fact that pain in the forearm is usually felt deeply in the muscle mass of the flexors of the wrist and fingers below the medial epicondyle of the humerus. On this basis pain above the elbow could also be explained by its reference to muscles receiving contributions from the sixth and seventh cervical roots. It is of great interest that in some of our patients pain of this sort has been produced experimentally with a pneumatic tourniquet inflated round the wrist. In this way pain in the arm in its typical form can be produced in a limb that is supported and inactive, and where no complicating traction on the shoulder girdle can be invoked.

Summary

The "acroparæsthesia syndrome" is defined.

It is argued that, whether this occurs spontaneously or is produced by some obvious cause, it is due to compression of the median nerve at the wrist in the carpal tunnel.

It can be speedily relieved by division of the flexor retinaculum.

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A PNEUMATIC-TOURNIQUET TEST IN THE CARPAL-TUNNEL SYNDROME

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IN a patient with acroparæsthesiæ it was found by chance that symptoms became very much worse when the circulation to the arm was arrested by a pneumatic cuff above the elbow. This phenomenon could be reproduced in other patients with acroparæsthesiæ due to pressure on the median nerve in the carpal tunnel (Kremer et al. 1953), and from it a helpful diagnostic test for the condition has been developed.

This work forms part of a larger study of the effects of ischæmia in peripheral nerve lesions (Gilliatt and Wilson, to be published).

Ischæmic Paræsthesiæ in Normal People

In normal people arrest of the circulation in the arm by the inflation of a pneumatic cuff above the elbow

is followed within one or two minutes by a faint "fluttering" or "vibrating" sensation in the hand or fingers, which usually develops into a diffuse tingle, uniform in quality and without the sharp pricking component characteristic of postischæmic paræsthesiæ.

50 patients without any neurological disorder affecting the hand were tested as controls, and some sensation of fluttering or tingling was experienced by all of them during ischæmia: in some it was restricted to the palm, and in others it was so slight that they found great difficulty in ascribing it to any particular finger. Often it was intermittent, appearing first in one finger and then in another, and any movement of the hand dispelled it altogether.

In patients in whom it was well marked, ischæmic tingling was either felt diffusely throughout the hand and fingers or else predominantly in the fifth and ring fingers and in the hypothenar region. It was never felt strongly in the median territory without the ulnar fingers being equally or more affected. In some cases the earliest sensation was on the median side of the hand, but there was always a moment during the succeeding three or four minutes when the patient would report a predominantly or purely ulnar distribution.

These findings confirm the observations of Weddell and Sinclair (1947), who reported an ulnar distribution of "compression tingling" in 5 out of 16 normal people, the sensation being diffuse in the remainder.

Ischæmic Paræsthesiæ in the Carpal-tunnel Syndrome

35 patients were tested in whom an irritative lesion of the median nerve in the carpal tunnel was suspected, and ischæmic paræsthesiæ were altered in 13 of them. In each of these 13 patients spontaneous attacks of painful tingling were occurring frequently at the time of the test, and there was a history of a succession of sleepless nights.

Within 30–60 sec. of the inflation of a cuff round the arm above the elbow, paræsthesiæ would start in the thumb, index, and middle fingers, and perhaps in the ring finger. Usually they took the form of an intense tingle, but 3 patients described sharp pricks, increased by deformation of the skin. As the paræsthesiæ increased in intensity they spread to the thenar pad and palm, and in 2 cases above the wrist to the radial side of the forearm. Intense tingling never spread to the little finger, which was usually described as "normal." Paræsthesiæ only gradually declined, and often persisted for as long as seven or eight minutes.

7 of the patients rapidly became distressed, and described a "tight" or "bursting" pain in the affected fingers and hand. All 7 identified this with their spontaneous pain at night, and in 2 of them it was so severe that the experiment had to be stopped. In 5 patients it was associated with an ache in the forearm muscles, and in 3 of them the pain extended above the elbow to the region of the cuff. There can be no doubt that these artificially induced attacks were similar to the patients' nocturnal symptoms. This is well illustrated by the fact that one old lady kept on trying to hang her hand over the side of the bed during the test, because this always relieved her attacks at night.

Median paræsthesiæ only occurred when severe irritation of the nerve was present, and in several cases disappeared during a temporary remission of symptoms. In all the cases the median paræsthesiæ and pain disappeared on retesting after operation.

Ischæmic Sensory Loss in the Carpal-tunnel Syndrome

In the patients with less severe irritation of the median nerve ischæmic paræsthesiæ were not usually altered, but median sensory loss appeared with abnormal rapidity during ischæmia; hence easily detectable numbness of all digits supplied by the median nerve was often present within 5–10 minutes of the inflation of a pneumatic tourniquet round the arm. Ischæmic sensory loss may appear first in the median territory in normal people (Sinclair 1948), but after a longer interval, and it is unusual for any definite change to be detectable within ten minutes of the onset of ischæmia (Gilliatt and Wilson). In the patients with acroparæsthesiæ the occurrence of sensory loss in all the median-supplied fingers has been regarded as suggesting damage to the median nerve when it has occurred within eight or ten minutes of the inflation of a cuff round the arm, particularly when a further interval of several minutes has elapsed before involvement of the remaining fingers.

In most of our cases abnormal findings during ischæmia disappeared within a few weeks of operation on the flexor retinaculum, but in some patients with well-marked preoperative sensory loss much longer periods elapsed before full recovery of sensation in the fingers, and in these cases the use of a pneumatic tourniquet was helpful in providing a sensitive test for residual nerve damage.

Illustrative Case-record

A married woman, aged 45, first seen in August, 1952, described attacks of tingling in the right hand for two years, with pain in the hand and arm at night.

Examination revealed no abnormal neurological signs, and a pneumatic tourniquet test on Sept. 5, 1952, gave a normal result; a sphygmomanometer cuff inflated to 220 mm. Hg round the right arm above the elbow caused mild paræsthesiæ, mostly in the ulnar fingers, and no sensory loss was demonstrable within ten minutes. By her next visit, on Oct. 16, 1952, the symptoms had increased, and she was being woken three or four times each night by pain in the right hand and arm, with frequent diurnal attacks of tingling in the fingers. No abnormal neurological signs were detected; but, when a pneumatic cuff was inflated round the arm, tingling began within thirty seconds in the index, middle, and ring fingers, the fifth finger being unaffected. After two minutes faint tingling appeared in the fifth finger, where it lasted for three minutes only. During this time intense tingling was accompanied by sharp pricking throughout the median territory in the hand, with some spread to the radial side of the forearm in its lower third. Faint paræsthesiæ were still present eight minutes after the onset of ischæmia, and after nine minutes the patient described a "dead but prickly" sensation in the median fingers when they were touched, the ulnar territory remaining normal.

Operation.—On Oct. 22, 1952, the patient was admitted to hospital for operation, by which time slight persistent sensory loss was demonstrable in the tips of the right thumb, index, and middle fingers, and on the median side of the ring finger. The pneumatic tourniquet test was repeated and again caused intense median paræsthesiæ, with an increase in the pre-existing numbness. The flexor retinaculum was divided on Oct. 23, 1952, and the patient was discharged from hospital the next day.

Follow-up.—On Nov. 13, 1952, the patient reported that she had been free from pain since the operation, but examination revealed slight residual sensory loss in the median territory on the right. No median paræsthesiæ occurred during a tourniquet test, but some increase in the pre-existing numbness resulted, and the median fingers were described as "very dead" after nine minutes. Two months later the patient was seen again, when she was symptom-free. No residual sensory loss was found on routine testing, and the tourniquet test had reverted to normal. Ischæmic paræsthesiæ were slight and felt diffusely throughout the hand, and no definite sensory loss could be demonstrated within ten minutes of the onset of ischæmia.

Discussion

For the altered ischæmic paræsthesiæ in our cases two possible explanations may be offered. It might merely be a question of an irritable focus at the wrist adding its effect to that of a segment of hyperexcitable nerve under a cuff above the elbow. This would be in accord with the generally accepted view that ischæmic paræsthesiæ in normal people arise in the segment of nerve

immediately under an occluding cuff (Kugelberg 1944, Weddell and Sinclair 1947, Merrington and Nathan 1949).

On the other hand, if some degree of ischæmia of the median nerve at the wrist were already present, it is possible that complete circulatory arrest might lead to an exacerbation of the local condition sufficient in itself to cause median paræsthesiæ and pain. Probably both of these mechanisms contribute, and in this respect it is interesting that in 3 patients a cuff inflated round the wrist was sufficient to produce intense median paræsthesiæ with pain in the arm as high as the shoulder, these symptoms being indistinguishable from those of the patients' spontaneous attacks (Kremer et al. 1953).

In our experience the characteristic paræsthesiæ and pain during ischæmia have only occurred with median-nerve lesions at the wrist, whereas early deterioration of sensation in an area of initial sensory impairment has been found during ischæmia in other peripheral-nerve and root lesions affecting the hand, regardless of the site of the lesion relative to the pneumatic cuff (Gilliatt and Wilson). Early ischæmic sensory loss in the median territory may occur with a lesion of the nerve at any level either above or below the cuff round the arm, and therefore its occurrence in the absence of median paræsthesiæ merely indicates pre-existing damage to the nerve at some point in its course. However, since these abnormal findings have disappeared after division of the flexor retinaculum in our cases, they must be regarded as giving additional support to the conclusion already reached on purely clinical grounds, that the "acro-paræsthesia syndrome" results from compression of the median nerve in the carpal tunnel.

Bharucha (1952) reported the early onset of muscular weakness after circulatory arrest in patients with peripheral neuritis and with the "acroparæsthesia syndrome," and also recorded attacks of painful tingling during ischæmia in his cases. Median-nerve damage was not considered as an ætiological factor by him, but there can be little doubt that it was present; for example, one of his cases was described as having "median neuritis" in one hand and the "acroparæsthesia syndrome" in the other, a combination which is easily understood if it is accepted that the two conditions are related. Bharucha also recorded attacks of painful tingling during the postischæmic phase, a finding which we have been unable to confirm. Most of our patients have identified the sharp discrete pricks of postischæmic paræsthesiæ with the pricking of their spontaneous attacks, but in none of them were they accompanied by pain. However, possibly with the longer periods of ischæmia used by Bharucha, painful "pseudo-cramp" (Lewis et al. 1931) may have accompanied postischæmic pricking and tingling, and this combination may have simulated the patients' spontaneous attacks.

Summary

In the diagnosis of the carpal-tunnel syndrome valuable information may be obtained by arresting the circulation to the arm. The occurrence during ischæmia of intense paræsthesiæ or early sensory loss restricted to the median territory may provide confirmatory evidence of pre-existing damage to the nerve.

We wish to thank Dr. Michael Kremer for allowing us to investigate his cases and for his helpful criticism and advice.

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INTESTINAL CUL-DE-SAC PHENOMENA IN MAN

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EVIDENCE has accumulated in recent years to suggest that intestinal cul-de-sacs in man and animals may cause apparently disproportionate nutritional disorders. Watson et al. (1948) made self-filling intestinal loops in rats, many of which later developed a macrocytic anæmia (Cameron et al. 1950) and steatorrhœa (Aitken et al. 1950). In man the making of stagnant intestinal loops in the course of operations has often caused megaloblastic anæmia to develop, a subject which is well reviewed by Cameron et al. (1949). It is not so widely known that steatorrhœa, often of considerable severity, may supervene. It is usually associated with intestinal hurry, creatorrhœa, vitamin-B deficiencies, hypoprotinæmia, and wasting. Cockett (1950) describes a typical case in which restitution of the normal continuity of the gut cured the patient.

Modern surgical trends focus attention on these phenomena because of the enormous increase in the practice of gastrectomy. There may well be 50,000 gastrectomised people in Britain, and of these the vast majority have had an operation of the Polya type. The occurrence of minor degrees of steatorrhœa, associated with a failure to regain preoperative weight, is a well-recognised sequel of this type of gastrectomy (Gordon-Taylor et al. 1929, Rekers et al. 1943, Wollaeger et al. 1946, Muir 1949); but in some cases steatorrhœa, severe enough to endanger life, may also develop (vide infra). Such nutritional disorders do not seem to occur after the Billroth I gastrectomy, which preserves the normal duodenal pathway (Wallensten and Gothman 1953).

Megaloblastic anæmia is held to be very rare after total gastrectomy. This is true; but what is not so well appreciated is that megaloblastic anæmia may follow *partial* gastrectomy and gastro-enterostomy. In reviews of the condition by Hurst (1932) and by Rowlands and Simpson (1932) there were examples of megaloblastic anæmia after all these operations, and others have since been reported. Such anæmias are often associated with severe steatorrhœa and other nutritional disorders, and the study of several cases reported here suggests that the steatorrhœa, the megaloblastic anæmia, and the other nutritional disorders occurring after gastrectomy may be due to the presence of a stagnant intestinal loop or an actual cul-de-sac.

Summary of Case-histories

Case 1.—Male, aged 60 at time of death (fig. 1).

1946.—Subacute intestinal obstruction due to disease in terminal ileum, thought to be regional ileitis, for which an emergency ileo-transversostomy was made, leaving a quarter of the small intestine and the ascending colon out of circuit.

1946–50.—Suffered from some fatty diarrhœa and distension but continued work as a dock labourer.

August, 1950.—Developed a macrocytic anæmia with a megaloblastic marrow which remitted after a single parenteral dose of vitamin B_{12} 25 µg. (reticulocyte peak 27%). Free acid was present in the gastric juice which, incubated with raw beef as in Castle's original experiment, produced a hæmopoietic response in an untreated case of addisonian anæmia. Steatorrhœa with only 75% absorption of 50 g. fat per day was present.*

September, 1950 to February, 1951.—Spontaneous remission.

March, 1951.—Megaloblastic anæmia present again.

* Most of the fat analyses were done by a "wet" method modified from that described by Van de Kamer et al. (1949). Total daily outputs were measured while patients were on ordinary ward diet.

April, 1951.—No hæmopoietic response to vitamin B_{12} 100 μg. orally.

May, 1951, to February, 1952.—Maintenance therapy with parenteral B_{12}. Continued work as dock labourer.

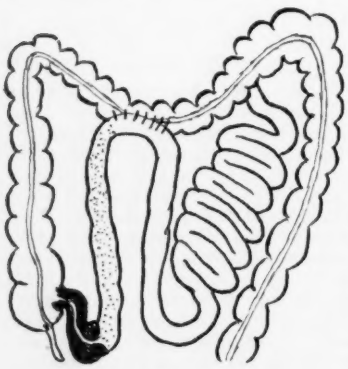


Fig. 1 (case 1)—Diagram showing ileo-transverse colostomy and blind loop due to argentaffinoma of terminal ileum.

February, 1952.—B_{12} discontinued.

March, 1952.—Megaloblastic anæmia recurred.

April, 1952.—Hæmopoietic response to aureomycin 15 g. given over five days (10% reticulocyte peak).

May, 1952.—Hæmopoietic response to folic acid.

October, 1952.—Sudden deterioration in general condition intestinal obstruction and death. Necropsy showed a chromaffinoma of the terminal ileum.

This case illustrates the development of steatorrhœa and a megaloblastic anæmia responsive to vitamin B_{12} in the presence of an intestinal cul-de-sac. The presence of intrinsic factor was proved by experiment.

Case 2.—Male, aged 62 at death (fig. 2).

1917.—Gastro-enterostomy with entero-anastomosis between a long afferent and the efferent jejunal loop.

1943.—Macrocytic anæmia diagnosed and treated with liver injections for one year only.

1948.—Readmitted to hospital with signs of multiple nutritional deficiencies—wasting, glossitis, blepharitis, angular stomatitis, hypoprotinæmia, peripheral neuritis, and a macrocytic anæmia. He had steatorrhœa and occasionally vomited offensive material. A gastrojejunocolic fistula was suspected but never demonstrated. A high-protein low-fat diet, with intramuscular injections of liver extract, aneurine (thiamine), and riboflavine, improved his condition very much. Treatment with liver extract lapsed after two years.

1951.—Readmitted to hospital where again a macrocytic anæmia, steatorrhœa, hypoprotinæmia, and a peripheral neuritis with extensor plantar responses, was found. No free acid was secreted by the stomach after histamine, but there was plenty of "resting juice" and certainly no achylia. The macrocytic anæmia responded to a single injection of vitamin B_{12} 50 μg., but thereafter the peripheral neuritis did not improve with massive doses of aneurine. Later continued B_{12} therapy improved the neuritis subjectively.

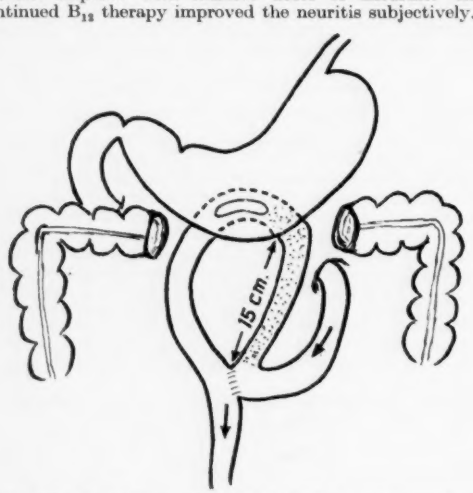


Fig. 2 (case 2)—Posterior gastro-enterostomy and entero-anastomosis leaving stagnant loop.

1952.—Patient died of rapidly growing carcinoma involving the stoma. At necropsy he was found to have a long afferent loop joined side-to-side with the efferent loop. The stomach was fixed immediately after death by the instillation of formalin through a stomach-tube (Magnus and Ungley 1938). That part of the fundus which was not infiltrated with carcinoma was normal histologically (fig. 3). There was no atrophy of the glandular structure and no round-cell infiltration as found in addisonian anæmia. The spinal cord showed considerable degeneration of the posterior columns.

This case illustrates the gross ileojejunal insufficiency which may develop very many years after gastro-enterostomy of this type. The anæmia, though responsive to vitamin B_{12}, was not caused by the same mechanism as in addisonian anæmia, and was presumably of intestinal origin. The clinical features, together with the histological findings, support a diagnosis of subacute combined degeneration of the spinal cord—a condition

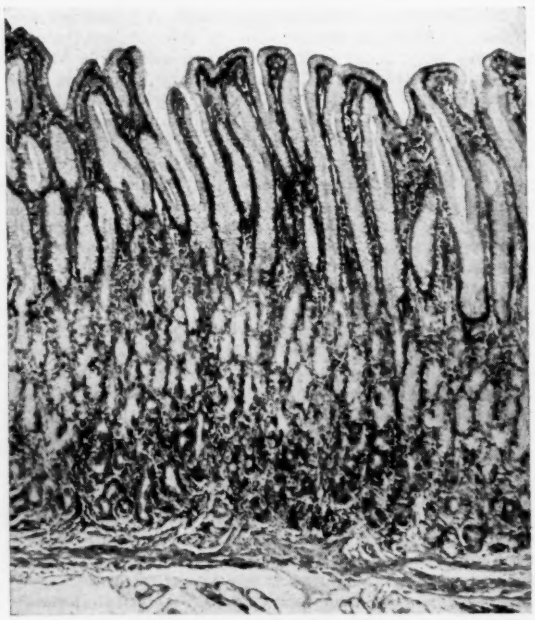


Fig. 3 (case 2)—Section from fundal end of stomach showing normal mucosa. (Hæmatoxylin and eosin, ×65.)

only rarely reported with intestinal megaloblastic anæmias.

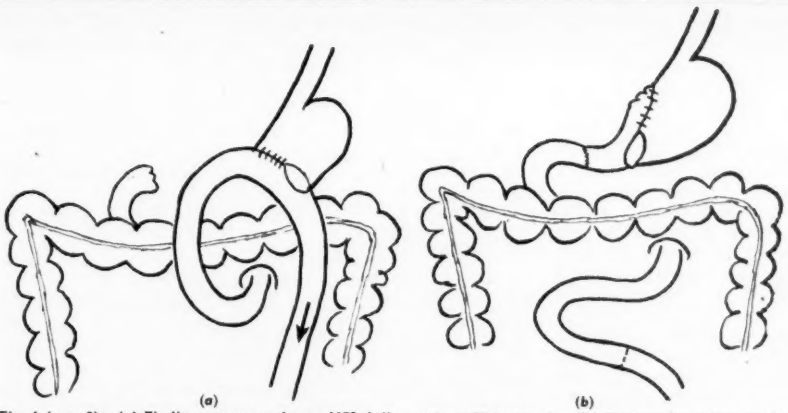
Case 3.—Male, aged 48 (fig. 4).

1948.—Three-quarters antecolic Polya gastrectomy (with long afferent loop) performed for alleviation of duodenal ulcer symptoms present for five years.

1951.—Diarrhœa and fæcal incontinence began. Found to have severe steatorrhœa with hypoprotinæmia. Temporary response to dietary treatment but relapsed after return home.

1952.—Readmitted in a wasted condition with starvation œdema. Daily excretion of fat averaged 46 g. Total serum-proteins 3·56 g. Intravenous plasma, protein supplements, and vitamin-B complex given to improve his condition sufficiently for an exploratory operation at which a long distended afferent loop was found. The wall of the upper jejunum was also thickened.

Owing to the shortness of the duodenal stump, a Billroth I anastomosis could not be done; so the afferent loop was divided at the point where it meets the lesser curve and a segment of the efferent loop some 2 in. long was used to bridge the gap between the stomach and duodenum. In this way the normal duodenal pathway was re-established. After operation, the patient made excellent progress. Diarrhœa ceased after a week, and a month later the average daily excretion of fat was down to 3·7 g. Three months after



(a) (b)

Fig. 4 (case 3)—(a) Findings at operation in 1952 (afferent loop 20 in. long); (b) Restoration of continuity of gut by means of intervening segment of jejunum from previous anastomosis.

operation he was back at work feeling extremely well, having gained 2 stone in weight. Total proteins were 6·8 g. per 100 ml. He has remained very well since.

This case illustrates a severe form of steatorrhœa with protein deficiency which may develop after a gastrectomy of Polya type. Just as with other cases of steatorrhœa associated with intestinal anastomosis, complete cure was effected by restoring the normal intestinal pathway and eliminating a stagnant loop.

Case 4.—Male, aged 55 (fig. 5).

1932.—Gastro-enterostomy.

1933.—Anastomotic ulcer treated medically.

1950.—Intractable diarrhœa and delusional insanity developed. Treated in a mental hospital.

1952.—In a wretched condition, wasted, incontinent of fatty fæces, and confused, with hypoprotinæmic œdema, glossitis, and finger clubbing (total serum-protein 3·4 g. per 100 ml.). Forty-eight-hour stool collection dried contained 49% of fat. Normochromic anæmia with red cells 3,900,000. Intensive dietary treatment, plasma transfusions, vitamin concentrates, liver, and folic acid helped to restore his health to a point where he could get about, feed, and dress himself. Plasma-proteins rose to 5·36 g. per 100 ml., and he gained 27 lb. in weight. His mental condition improved though he remained mildly demented. Steatorrhœa persisted, though it was no longer troublesome.

1953.—Steatorrhœa still present. Average daily fat excretion 20·6 g. Plasma-protein 6·1 g. per 100 ml. Exploratory operation revealed an apparently normal gastro-enterostomy with enormous dilatation of the duodenum (to about five times normal size). The cause of this was not clearly determined, but it appeared to be due to adhesions near the duodenojejunal flexure, possibly in association with the anastomotic ulcer which was now healed. A Billroth I gastrectomy was done and normal continuity of the gut restored. He made a good recovery, and three weeks after operation the average daily fat excretion was 13·6 g. Total protein 6·8 g.

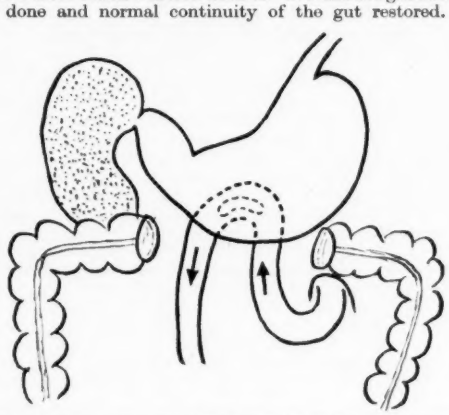


Fig. 5—Gastro-enterostomy with gross dilatation of duodenum.

Case 5.—Male, aged 55.

1935.—Gastro-enterostomy after which he developed a jejunal ulcer.

1948.—Antecolic Polya gastrectomy done, using a more distal loop of jejunum for the new anastomosis. The afferent loop was therefore longer than usual.

1952.—Hypochromic anæmia developed which improved with intravenous iron treatment.

1953.—Macrocytic anæmia developed with a megaloblastic bone-marrow. No free acid secreted after histamine, but gastric juice was not scanty. Barium studies showed dilatation of the afferent loop with antiperistalsis therein. Steatorrhœa was inconstant, fat excretion being very high on some days but within normal limits on others.

A small but definite reticulocyte response to oral aureomycin occurred. Parenteral vitamin B_{12} later gave a maximal response. The patient's gastric juice given with oral B_{12} to an untreated case of addisonian anæmia caused a small reticulocyte response.

This patient, who remains under observation, illustrates the development of a megaloblastic anæmia after a Polya gastrectomy. The cumulative evidence suggests that the macrocytic anæmia is due to stagnation in the afferent loop and not to atrophy of the glandular structure of the stomach. The definitive evidence of gastric biopsy is still lacking, and the attempt to cure the macrocytic anæmia by conversion of the Polya gastrectomy into a Billroth I has not therefore been made.

Discussion

Isolated cases similar to those described above have often been reported. Seip (1950) records a case of steatorrhœa and megaloblastic anæmia following a Polya gastrectomy. MacPhee (1953) has only recently described a case of severe steatorrhœa after Polya gastrectomy, and mentions others known to him; Frankel and Moore (1953) commenting on his report, describe a further case with megaloblastic anæmia as well as steatorrhœa.

Brown (1949), after studying a patient with an intestinal cul-de-sac who was suffering from steatorrhœa and multiple vitamin-B deficiencies, concluded that an altered bacterial flora within the intestine was responsible for the syndrome. Certainly an altered intestinal flora might provide an explanation for the megaloblastic anæmia of intestinal cul-de-sacs and strictures. This anæmia is due to a B_{12} deficiency, for low serum levels have been reported in two cases (Mollin and Ross 1952), and the anæmia responds readily to parenteral B_{12}. Yet there is no obvious fault in the B_{12}-binding mechanism within the stomach as there is in addisonian pernicious anæmia. B_{12}, adequately bound in the stomach, might be destroyed, used up, or inactivated within the disorganised microbiological environment of the small intestine.

Such a hypothesis is supported by four facts which stand out when the clinical histories are examined. Firstly, there may be an interval of many years between the making of the cul-de-sac and the development of the nutritional disorders. Secondly, spontaneous remissions may occur. Thirdly, intensive dietary treatment usually helps to bring on a remission. Fourthly, the nutritional disorders are cured at once by restoring the continuity of the gut. Whatever the mechanism may be,

the severe ileojejunal insufficiency occasionally found after Polya gastrectomy is clinically similar to that associated with blind loops of intestine lower down.

It has been suggested that the mild steatorrhœa found after Polya gastrectomies is due to imperfect mixing of the biliary and pancreatic secretions with the food. This, however, would not explain the more severe steatorrhœas nor those associated with cul-de-sacs in the ileum. Furthermore, many patients who survive a total pancreatectomy have no steatorrhœa. Again, when steatorrhœa due to pancreatic deficiency occurs, microscopical examination of the stools reveals numbers of fat globules, not excess of fatty-acid crystals as found in the cases now reported. There is a good deal of evidence that intestinal hurry is present in this type of case, but it is unlikely that this can be the sole cause of the disorder; for most clinicians and radiologists are familiar with patients who transport barium from pylorus to cæcum in under half an hour yet have no steatorrhœa or wasting.

The similarity of the cul-de-sac syndrome with that found in gastrojejunocolic fistula is quite evident, and in the latter condition there is a gross disorder of the microbiological and the physicochemical environment of the small intestine. The formation of a stagnant loop might similarly favour the development of disordered environment in the rest of the intestine, which would lead to impaired absorption of fat and protein and the using up of growth factors. Once such an environment was established, the accumulation of fatty acids and the resultant alteration in pH might further interfere with absorptive and bacterial processes. Thus a vicious circle is set up which can be checked only by the strictest dietary treatment.

Such a hypothesis would help to explain the long delay between the formation of the cul-de-sac and the development of the full syndrome, the considerable improvement to be obtained by dietary treatment, and the tendency to natural remission and exacerbation.

The study of cul-de-sac phenomena has certain practical implications. Surgeons should, whenever possible, avoid permanent procedures which leave stagnant areas of gut out of continuity. The risk of trouble is greatest if peristalsis leads into the by-passed segment, but even loops which may be expected to empty by normal peristalsis may not always do so, particularly after a long time has elapsed.

The gastrectomy of Polya type, with a long afferent loop, seems to be a potential source of trouble, and one which will not diminish with the passage of time. A procedure for gastrectomy which is technically feasible yet retains continuity of the gut is most desirable if we are to consider sufficiently the future health of the large numbers of people annually submitted to gastrectomy.

Summary

The patient in whom an intestinal cul-de-sac is artificially created is liable, after an interval, to develop disorders including steatorrhœa, creatorrhœa, wasting, hypoprotinæmia, and vitamin deficiencies—notably a deficiency of vitamin B_{12} causing a megaloblastic disorder of hæmopoiesis and degenerative changes in the central nervous system.

Three cases are described which illustrate the development of such a megaloblastic anæmia. In one, intrinsic factor was present in the gastric secretion yet B_{12} was not effective orally: B_{12} was fully effective parenterally and aureomycin produced a good hæmopoietic response. In the second case spinal-cord changes were seen at necropsy although the gastric mucosa was not atrophied. In the third case a Polya gastrectomy with stagnation in a long afferent loop led to a megaloblastic anæmia.

Two other cases are described to illustrate the hypoprotinæmia and steatorrhœa which may develop after a Polya gastrectomy or a gastro-enterostomy. In one case the ileojejunal insufficiency was completely cured by restoring the normal continuity of the gut.

In discussing the ætiology of these cul-de-sac phenomena, attention is directed to possible chemical, physical, and microbiological changes in the intestinal contents.

We are greatly indebted to Dr. F. J. Lewis for the hæmatological investigations and to Dr. J. Guy and Dr. F. M. Dodgson for the necropsy reports. We wish also to thank Dr. G. Airth for the radiological studies and Dr. F. Bolton, Dr. L. Mandelbaum, and Dr. R. Hill for much assistance in the management of these patients.

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Preliminary Communication

THE ADRENAL GLANDS AND GINGIVAL HYPERPLASIA DUE TO PHENYTOIN SODIUM

GINGIVAL hyperplasia is a common side-reaction in epileptic patients receiving phenytoin (5,5-diphenylhydantoin, 'Dilantin') sodium therapy. King [1] has shown that continued administration of the drug to ferrets may produce a rather similar condition; but in mice [2] and rats [3] there is apparently no gingival reaction. In man and in the ferret the development of this gingival hyperplasia is influenced by the presence of chronic gingival irritation, such as may be produced by dental calculus or deficient anterior labial seal.[1 4] Since phenytoin sodium affects the adrenal glands in

1. King, J. D. *Brit. J. exp. Path.* 1952, **33**, 491.
2. Staple, P. H. *Lancet*, 1951, i, 1074.
3. Bergman, G. *Svensk tandläk. Tidskr.* 1950, **43**, 493.
4. Staple, P. H. *Brit. dent. J.* 1953, (in the press.)

EFFECT OF PHENYTOIN ON WEIGHT OF ADRENAL GLANDS OF FERRETS

Male ferrets.
Total wet weight of both glands before fixation

Controls						Phenytoin sodium		
Untreated			Saline solution					
Animal	mg.	mg. per 100 g. body-weight	Animal	mg.	mg. per 100 g. body-weight	Animal	mg.	mg. per 100 g. body-weight
K.353	140	10·5	K.390	180	13·2	K.387	203	17·2
K.354	151	11·4				K.391	175	15·3
K.356	120	10·0						
K.360	121	9·8						
K.361	150	10·6						
K.362	181	14·5						
Female ferrets								
K.376	103	16·6	K.357*	81	8·9	K.359	211	26·1
K.386	96	16·4	K.364	110	17·2	K.366	126	18·1
			K.388	139	17·4			

* One gland damaged during removal.

mice,[2 5] rats,[6] and guineapigs,[7] it was of interest to see whether the gingival hyperplasia in ferrets was associated with any adrenal abnormality.

Ferrets, aged 18–22 weeks and weighing 835–1020 g., were given the following basal diet (per animal per day):

White bread (crust removed), 70 g.
Horse meat (pressure-cooked), 20 g.
Milk (pasteurised), 114 ml.
Salt mixture (McCollum 185), 1 g.
Food yeast, 0·85 g.
A and D oil (1000 I.U. vitamin A, 100 I.U. vitamin D per ml.) 2 ml.
Tap water, ad lib.

In addition, all animals were allowed to gnaw horse rib bone to minimise the deposition of dental calculus, which otherwise takes place with this diet. Treated animals received intramuscular injections (6–8 ml.) of an aqueous suspension of phenytoin sodium (Parke, Davis & Co.), 15 mg. per kg. body-weight, thrice weekly for one month, then twice weekly for the rest of the experiment. Controls received similar volumes of sodium chloride solution such that the amount of sodium was the same as that given as phenytoin. The animals were sacrificed after 191–204 days.

No gingival hyperplasia was apparent on oral examination made at regular intervals; and in-vivo capillary microscopy[8 9] carried out towards the end of the experiment failed to show any differences between the two groups. Subsequent histological examination of the gingivæ confirmed these findings. However, the weight of adrenal glands of treated animals differed both from those of controls receiving saline and also from those of untreated animals of similar age who were fed the same basal diet with or without bone (see accompanying table).

Histological examination showed that in treated animals the birefringence pattern of the adrenal cortex was altered and that there was a redistribution of sudanophil material in the fascicular zone. Morphological changes were also present in this zone and in the reticularis, which was no longer well defined and often contained an increased number of cells with small nuclei staining deeply with hæmatoxylin. In one animal (K.359) most of this region and parts of the fascicular zone were heavily infiltrated with lymphocytes.

These preliminary results further support the concept that gingival hyperplasia due to phenytoin may be an exaggerated tissue response to injury in subjects with deranged adrenocortical function.[10] A further experiment is in progress to study the effect of continued administration of the drug to ferrets in which chronic gingival irritation has been allowed to develop by giving them the basal diet without bone to gnaw.

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5. Staple, P. H. *Lancet*, 1952, i, 372.
6. Woodbury, D. M. *J. Pharmacol.* 1952, **105**, 46.
7. Emmett, A. D., Hartzler, E. R., Brown, R. A. *Ibid*, 1943, **78**, 215.
8. King, J. D. *Brit. dent. J.* 1944, **77**, 213.
9. King, J. D. *Dent. Rec.* 1947, **67**, 3.
10. Staple, P. H. *J. Endocrinol.* 1953, **9**, xviii.

Reviews of Books

Social Aspects of Disease

A. LESLIE BANKS, M.D., F.R.C.P., D.P.H., professor of human ecology, Cambridge University. London: Edward Arnold. 1953. Pp. 373. 20*s*.

WHEN the University of Cambridge created a chair of human ecology after the late war, some doubts were expressed about the usefulness of the new departure. If further justification were needed, this book in itself goes far to justify both the establishment of the chair and the appointment of Dr. A. L. Banks as its first occupant. Designed primarily for the great and growing army of medical auxiliaries, including the non-professional laymen who control and administer our health services, this book will also answer, for the medical student or the clinician, the question "What has social medicine to do with me?"

After an introductory chapter and sections on disease of the body as a whole and on infectious diseases, Professor Banks describes the systems, including their development, the particular diseases of the system, and the social aspects of each. Then there are chapters on the mother and child; the infirm and incurable; and mental, psychosomatic, and personality disorders. It is difficult to praise too highly the skill with which the essential facts and the social implications are condensed into a flowing narrative, full of wisdom and erudition and with none of the important points left out. Let the reader who thinks this is easy try to write two or three readable pages summarising the medical facts and social aspects of, say, nephritis, blood-transfusion, or hearing defects.

Here and there, some slight omissions or differences from the commonly accepted view must inevitably be found. Thus, the effect of chlorination of water-supplies is not referred to under typhoid, and one would like to know the evidence for "strong tobacco accounting for many cases of bronchitis," but such points are remarkably few. It is a pity that the League of Nations is not mentioned in view of the great emphasis which its Health Organisation gave to social and environmental aspects of ill health, and perhaps something could usefully be added on the contrasts between the social impact of disease in primitive, as compared to civilised, communities, though there are allusions to this under certain diseases, such as tuberculosis. The historical contrasts—"then and now"—are admirably covered. The sections on the chronic sick and, included in them, the discussion of the cancer problem are particularly good.

Where so many paragraphs are little masterpieces, a quotation is hard to choose, but the flavour of the book may be gained from this passage in the section on diseases of the heart and circulation:

"It is fashionable to blame the stress of our modern social system for these conditions, but society now provides an adequate education for everyone and it cannot really be expected to put the clock back to the slow rhythm of the pre-industrial era simply because its members ignore warning signals or forget that they are made of flesh and blood instead of wood and steel. In this matter the responsibility lies with the individual to use common sense. The State can provide medical and social services but it cannot live the individual's life for him and must not attempt to do so. If a man chooses to go all out for success he must be prepared to pay the price for it."

The Epidemiology of Health

A New York Academy of Medicine Book. Editor: IAGO GALDSTON, M.D. New York and Minneapolis: Health Education Council. 1953. Pp. 197. $4.

THIS is a most stimulating book. Thirteen contributors set out to expound "the entire text" of the epidemiology of health, which was first briefly discussed in 1947 at the well-known Institute on Social Medicine of the New York Academy of Medicine. The fifteen chapters include three on the evolution of the subject, by John E. Gordon, which are more fascinating, erudite, and internationally fair than any similar account known to us. He traces the various streams of development in medicine which have resulted in the modern holistic and ecological approach, now expressed as the biological gradient of disease, which make possible a similar appraisal of health. He discusses the triple approach from experience and observation, from experiment, and from conceptual hypothesis, and enlivens his account by such sentences as:

"Sanitation is no less necessary because it has reached a high level of efficiency. The results in certain countries, where a new health program has been founded on B.C.G. instead of on privies, are instructive." "The distinction between the well and the sick is arbitrary and it is largely governed by available methods of measurement, clinical and laboratory." "Proof, either from direct observation or experimental test, has never kept pace with well-defined hypothesis."

Among his heroes are Fracastorius and the less known Ballonius, Kircher, Redi, Hecker, Parkin, Hirsch, Henle, and Panum. Sydenham and Galen get bad marks because of the too lasting effects of their misconceived hypotheses: "If Galen was not the originator of armchair epidemiology, he had a lot to do with it."

Other particularly stimulating chapters are by O. Temkin on "What is health?", Erich Lindemann on mental hygiene, Granville W. Larimore on health education, and R. W. Gerard on the functional approach to medical practice and education—which, like that by Roger I. Lee on "Physicians for the Healthy," is stuffed with good and apposite stories. Admittedly some contributors discuss health in their opening paragraphs and then turn gratefully into the well-trodden path of the epidemiology of disease and the triumphs of preventive medicine in their fields.

Though "the entire text" of the epidemiology of health may not be here, there is more than enough to justify publication. There are some distressing new words and some awkward methods of expression, which make one wonder if the American child, instead of saying "I can't do my sums" is liable to complain "My biologic dynamism is functionally insufficient for total quantitation"; but, all the same, anyone concerned with the broader aspects of the evolution of medicine cannot fail to benefit from reading this book.

Psychiatrie Heute. Prof. KURT SCHNEIDER, Heidelberg. 1952. Pp. 32. D.M. 2.85.

Über den Wahn. Professor SCHNEIDER. 1952. Pp. 48. D.M. 3.90.

Die Grenzen der Psychotherapie. Prof. G. EWALD, Göttingen. 1952. Pp. 36. D.M. 3.30.

Das Verstehen und Begreifen in der Psychiatrie. Prof. F. A. KEHRER, Münster. 1952. Pp. 58. D.M. 5.70.

Klinische Probleme der vegetativen Regulation und der Neuropathologie. Prof. FERDINAND HOFF, Frankfurt. 1952. Pp. 43. D.M. 2.70.

Hirnatrophische Prozesse im mittleren Lebensalter. Dr. F. W. BRONISCH. 1951. Pp. 105. D.M. 12.60.

Angst und Schreck in klinisch-psychologischer und sozialmediznischer Sicht. Prof. FRIEDRICH PANSE, Bonn. 1952. Pp. 189. D.M. 12.60.

Das Problem der Schizophrenie. Dr. HAROLD SCHULTZ-HENCKE, Berlin. 1952. Pp. 308. D.M. 27.

Psychische Komponenten der Sinnesorgane: eine psychophysische Hypothese. Prof. BERNHARD RENSCH, Münster. 1952. Pp. 200. D.M. 22.50.

All the above are published by Thieme of Stuttgart.

Die Narkoanalyse als initiale Methode in der Psychotherapie. Prof. CARL FERVERS. München: Lehmann. 1951. Pp. 120. D.M. 9.

A COLLECTION of recent psychiatric publications from Germany contains very few full-size books, but consists mainly of pamphlets, booklets, and small monographs. The content of most of them is equally slight; very few point to novel developments, practical or theoretical.

In an academic oration, Kurt Schneider sums up his well-known and well-tested views on psychiatry today; equally well founded, but equally restricted, is his theory of the delusion as a psychiatric symptom, which he restates in another pamphlet. A pamphlet on the limitations of psychotherapy is based on lectures given by G. Ewald to obstetricians and gynæcologists; in them he took the opportunity to refute the excessive claims of psycho-analysis in the field of medicine and surgery. F. A. Kehrer reviews the opinions of leading writers on the distinction, much debated in German psychiatry, between "empathy" (i.e., the direct understanding of the patient's behaviour) and its psychological explanation and measurement in scientific terms.

Ferdinand Hoff claims priority for the description of certain symptoms included in Selye's theory of the "adaptation syndrome"; he surveys critically this and similar hypotheses designed to explain the reaction of the patient to unspecific stimuli and therapies of various kinds, and he propounds again his scheme, first suggested in 1934, of vegetative regulation, illustrating in a graph the interplay and reciprocity of central and peripheral nervous stations with humoral and hormonal factors.

Solid factual surveys are a familiar feature of German literature, and F. W. Bronisch's study on chronic organic psychosis in 14 middle-aged patients falls into this class. The nature of their illness was difficult to determine, and diagnosis remained uncertain in many instances even after air-encephalography had demonstrated some cortical atrophy. Of 6 cases which came to necropsy, 2 had suffered from disseminated sclerosis, 3 from one of the presenile dementing processes (Jakob-Creutzfeld), and 1 remained undiagnosed. The clinical pictures varied considerably; according to Bronisch, in this age-group the brain seems to react to the atrophying disease with a greater variety of symptoms than it does in the senile psychoses. Mental tests were not applied; these, and electro-encephalographic recordings, might well have given further information. The monograph touches an important and difficult problem on the neuropsychiatric borderline.

F. Panse's booklet throws interesting light on the absence of neurosis in the civilian population during the 1939–45 war. He interviewed 95 persons of all classes and ages who had survived severe air attacks on German towns; 20 of these interviews are reproduced verbatim, and from these Panse has tried to learn something new about anxiety, fright, and panic. He found "emotional paralysis" (Baelz), illusions of subjective time experience, phenomena of primitive instinctual behaviour, sensitisation, and some slight adaptation to repeated attacks. Hysterical and other neurotic reactions to these terrifying situations were as rare in Germany as they were in this country. That so little that is new emerges from Panse's careful investigation is due to his restricted approach. He has concentrated on the psychology of the frightened person as an isolated unit: the great rôles of interpersonal relations, mass psychology, and crowd influence are almost entirely ignored, and are certainly not dealt with from the viewpoint of modern sociology.

H. Schultz-Hencke's book on the problem of schizophrenia is larger in size than those so far mentioned, but in it he merely repeats his special brand of analytical psychology, applying it to schizophrenic patients. Like some American workers who use Freud's analytical concepts in the treatment of schizophrenia, he claims to prevent chronicity and deterioration by his method.

Bernhard Rensch, in a book on the "psychic components of sensory organs," launches an assault on the cortex, the universal computing machine. In his "psycho-physical hypothesis," Rensch attempts to shift the emphasis from the brain to the sensory organs. Perception and imagery are experienced, and "therefore" according to his argument, take place in the sense-organs, which are much more differentiated in anatomy and construction than is their cortical representation. According to Rensch, the cortex is merely an associative centre and mainly serves movement and activity. Psychologically, the book follows the teaching of the association schools of the last century. The data from physiology and pathology presented to prove the hypothesis are a mixture of old and new, selected with virtuosity and erudition worthy of a better cause. However, the author points out that he writes "as a philosopher, not as a biologist, for a biologist would not advance a hypothesis passing so far beyond his special field."

Finally Carl Fervers describes—for the benefit of the general practitioner—narco-analysis as a method of introducing psychotherapy and establishing contact with the patient; the procedure and its results are illustrated by case-histories. On the whole, he follows Kretschmer's theory of neurosis and ideas on psychotherapy, but takes the opportunity to discuss general psychopathology and review the opinions of other schools.

Dermatologie

ROBERT DEGOS, professor of skin diseases and syphilis, Faculty of Medicine, Paris. Paris: Flammarion. 1953. Pp. 1124. Fr. 8600.

THIS valuable work is designed to keep physicians up to date without the necessity of repeatedly buying new editions. It consists of 1124 loose leaves, and an index, cased in a strong binding which allows sufficient space for annual additions in the next few years. Professor Degos confines himself to pathological processes in the skin, omitting its anatomy and physiology. The text is clear and well set out for quick reference; the illustrations—mostly from his own collection—and the microphotographs are first-class; and references are extensive and include many which may be omitted from works in English. This work is essentially for the dermatologist, and it can be recommended without reserve.

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THE LANCET

LONDON: SATURDAY, SEPT. 19, 1953

The Way We Walk

DOCTORS have given more attention to abnormalities in the structure and function of the locomotor system than to the way it works normally. It was not so with the Ancients, who had to learn by observation. Two millenniums ago HIPPOCRATES made many records showing the fundamental nature of his thought, and this tradition of learning continued until the time of GALEN; but thereafter, although the written words of the great teachers remained, the spirit was lost and the minds of succeeding generations were submerged in darkness and superstition. Fundamental thought did not return until the 17th century, when, for the first time, there emerged not only a real conception of muscle action but also the realisation that the body was subject to the ordinary laws of physics. In the next two hundred years considerable progress was made along strictly mechanistic lines, with detailed and surprisingly accurate analysis of body movements. By the end of the 19th century so much was known of the mechanics of locomotion that the introduction of experimental physiology and the stimulus of SHERRINGTON's work might have been expected to result in a surge of enthusiastic inquiry into the commonest of human activities—movement. But in fact the opportunity was neglected, and during the past fifty years the new knowledge, with few exceptions, has been applied to man only by the armchair philosopher. It is therefore especially noteworthy that two articles on normal function take pride of place in the 50th-anniversary issue of the *Journal of Bone and Joint Surgery*. This journal is the lineal descendant of the *Transactions of the American Orthopedic Association*. The name was changed in 1903 to the *American Journal of Orthopedic Surgery* so that it could better represent American orthopædics as a whole. After the first world war, when the orthopædic surgeons of Britain and America were brought together under the kindly guidance of Sir ROBERT JONES, the journal became as well the official publication of the British Orthopædic Association. A few years later the name was changed to the *Journal of Bone and Joint Surgery* in order to reflect the increasing scope of this branch of surgery. The second world war tied yet tighter the bond between the two countries, and for the past five years the journal has been published alternately in the United States and Great Britain. It is now the official publication of the orthopædic associations of North America and of every country in the British Commonwealth. It is, indeed, an international effort representing the practice of orthopædic surgery in the entire English-speaking world.

STEINDLER,[1] in the opening article, dates the history of the study of locomotion from the middle of the 17th century, when BORELLI enunciated the fundamental problems of gait. BORELLI not only conceived the idea of reciprocal muscle action but also described the way in which propulsion of the body is achieved by the forward displacement of the centre of gravity beyond the supporting area, and the subsequent restoration of balance by the forward swing of the leg. This striking advance may have been made possible by the influence of DESCARTES. This great philosopher, dissatisfied with the method of scholasticism then in vogue, applied the method of mathematics to natural phenomena; and thus he rid himself of the need to follow "authority," since there were few mathematical precedents in the Jesuitical society to which he belonged. Detailed study of the mechanics of gait began with the development of photography in the latter part of the 19th century. The consequent rapid progress culminated in the classic work of BRAUNE and FISCHER, whose mathematical analysis of the physics of human gait is unsurpassed. The dynamic side of the problem remained untouched, however, and little was known of the precise rôle of the different muscles and the energy expended by each during walking. The second world war created a demand for information of this type, in order that the basic design of artificial limbs might be reconsidered. Hitherto the construction of prostheses had been entirely empirical, and there were several faults that were not easily rectified. The problem was tackled in the United States with characteristic energy; under the auspices of the National Research Council, teams were established to engage in fundamental research in locomotion. This is essentially a long-term project; and much of the work is being done at the University of California by a happy group including the professors of civil engineering, of anatomy, and of orthopædic surgery. The study of locomotion involves not only the measurement of the magnitudes, directions, and rates of the several translations and rotations with respect to three coördinate axes in space, but also the correlation of this information as regards both space and time with the gravitational and muscular forces involved. Much has been achieved; and with great skill SAUNDERS and his colleagues[2] present some of their findings in a way that is intelligible to the reader with scanty knowledge of mathematics.

Efficient locomotion is defined as the translation of the centre of gravity of the body through space along the pathway requiring the least expenditure of energy. The San Francisco workers set out to analyse this concept by studying the interaction of six major determinants, each of which displaces the centre of gravity—pelvic rotation, pelvic tilt, knee and hip flexion, knee and ankle interaction, and lateral pelvic displacement. The sum of these displacements determines the path of the centre of gravity. This path is smooth and undulating and corresponds very closely to the sinusoidal figure which theoretically is the most economical of energy. This desirable method of locomotion is presumably reached by experiment—in children the pattern is variable and irregular until the age of about seven years. Individual variations in walking are due to exaggeration of one of the determinants, but, by compensation of the other determinants, the pathway of the centre of gravity is maintained virtually unchanged; in other words, the expenditure of energy is not increased by individual

1. Steindler, A. *J. Bone Jt Surg.* 1953, **35A**, 540.

2. Saunders, J. B. de C. M., Inman, V. T., Eberhart, H. D. *Ibid*, p. 543.

peculiarities, and even the characteristic gait resulting from high heels is reasonably economical.

Not every fundamental research has an immediate clinical application, but this has. Investigation of the energy used during locomotion makes it clear that most of the propulsive effort involved in walking on the level is supplied by the muscles operating the ankle and hip. Study of pathological gait resulting from stiffness of one of these joints has shown that excellent compensation is brought about naturally and the path of the centre of gravity is but little disturbed. The behaviour of the knee is rather different because, when functioning normally, it does not add to the propulsive effort but instead dissipates energy by flexing to decrease the vertical displacement of the centre of gravity. Some of the energy involved is "stored" and returned in the later part of the swing phase by imparting continued forward acceleration to the body at the time when most of its potential energy is lost. A stiff knee cannot be compensated fully; the limb has become a single, instead of a double, pendulum, and the energy necessary to initiate the swing phase is thereby increased threefold. The greater the amount of flexion in which the knee is fixed, the smaller is the amount of energy required to move the limb. Those with an above-knee amputation are quick to appreciate that walking with a free-swinging knee-joint takes less effort, and they refuse any device designed to reduce limp by making the joint tighter.

Arterial Grafting

IT may be necessary to restore the continuity of a large artery because of injury, stricture, or damage by disease, and where the divided ends cannot be safely approximated a prosthesis or graft must be used. Unfortunately the use of artificial tubes of glass, vitallium, steel, silver, or plastic eventually leads to thromboses, and these materials probably have little place in civilian surgery. Arterial homografts have proved much more promising, although adequate follow-up studies have not yet been completed. Since the early experiments of JABOULAY and BRIAU [1] in 1896 and CARREL [2] in 1902, a great deal of work has been done on the preservation, viability, and fate of arterial grafts, particularly in the U.S.A. The earlier reports of GROSS [3] and his colleagues favoured the preservation of the donor graft in a nutrient medium at 2°C. Such tissues, however, became unusable after a few weeks' storage; and if no suitable patients came along a large proportion of the grafts had to be discarded. Moreover, the efficient storage of the grafts called for skilled handling, and it was clear that this method of preservation was practicable only in a few special clinics. Treatment of the grafts by formalin, alcohol, or cyanide greatly increased the risk of thrombosis; so the value of preservation by freezing was investigated. In 1951 DETERLING et al.[4] demonstrated that, in the "ice-zone" down to −40°C, crystal formation caused considerable histological change and disruption of the cell membranes. But by quick freezing with liquid nitrogen to −195°C, followed by the dehydration of the graft under a vacuum at deep-freeze temperatures (the so-called "lyophilisation" [5]), this drawback could be overcome; and the graft could then be stored for long periods at ordinary room temperatures. HUFNAGEL and EASTCOTT [6] found that dogs' aortas that had been frozen rapidly in liquid nitrogen often showed fine cracks extending into the lumen; the smaller grafts were not affected in this way. But when the larger grafts were subjected to a two-phase freezing gradient, they were undamaged on thawing. The method of freeze-drying obviously makes it easier to transport the graft and use it, for example, under active service conditions. And it seems likely that its viability, as judged by its capacity to respire at the time of its insertion into the host, is not essential for a satisfactory result. As with many other tissue homografts, the artery acts rather like an organic strut along which host cells and fibrin can form.[7] The sterilisation of the frozen grafts has presented many difficulties, for the activity of antibiotics is much reduced at low temperatures. BRUNNEN [8] has tried to sterilise the arterial segments by irradiation with 1·5 million röntgen-equivalent physical units over a period of 15 to 75 seconds. He thinks, however, that this makes thrombosis in the grafted segment more probable, and he suggests that a shorter time of exposure, such as is possible with a capacitron generator, may avoid protein denaturation.

The first results of arterial homografts in animals and man have been fairly satisfactory when healthy host vessels have been anastomosed, and the lumen may remain patent for years, although the graft loses its normal resilience and shows definite histological changes. It has lately been found that the inflammatory reaction surrounding the site of a homograft cannot be suppressed with cortisone.[9] GROSS [3] reported 14 successful aortic grafts for coarctation out of 19 cases; and BROCK's view [10] is that it is not justifiable to operate for coarctation, in a patient in the late teens or older, unless a homograft is available. The behaviour of a homograft in a growing child needs further examination, but in quick-growing animals, such as pigs, the graft does not generally enlarge pari passu with the animal.[11] When the host vessels have undergone degeneration the technical difficulties of grafting are much increased, and leakage at the suture line and thrombosis are more common. Dissection during the operation may destroy essential collateral vessels, and if the graft fails a limb may be lost. Again a successful and patent graft in the leg may unmask or exaggerate an angina of effort. Although OUDOT [12] has reported 2 successful grafts in patients with thrombosis at the aortic bifurcation, it is doubtful whether the excision of thrombosed and degenerated vessels will win an established place in vascular surgery.

While much is still to be done in this branch of reparative surgery, the encouraging achievements with homografts in certain conditions—notably

1. Jaboulay, M., Briau, E. *Lyon méd.* 1896, **81**, 97.
2. Carrel, A. *Ibid*, 1902, **98**, 859.
3. Gross, R. E. *Ann. Surg.* 1951, **134**, 753.
4. Deterling, R. A., Coleman, C. C., Parshley, M. S. *Surgery*, 1951, **29**, 419.
5. Marrangoni, A. G., Cecchini, L. P. *Ann. Surg.* 1951, **134**, 977.
6. Hufnagel, C. A., Eastcott, H. H. G. *Lancet*, 1952, i, 531.
7. Hiertonn, T. *Acta orthopæd. scand.* 1952. Suppl. no. 10.
8. Brunnen, P. L. *Guy's Hosp. Rep.* 1953, **102**, 194.
9. Barberio, J. R. et al. *Surgery*, 1953, **33**, 827.
10. Brock, R. C. *Guy's Hosp. Rep.* 1953, **102**, 204.
11. Nyhus, L. M., Kanar, E. A., Moore, H. G. jun., Schmitz, E. J., Sauvage, L. R., Harkins, H. N. *Surg. Gynec. Obstet.* 1953, **97**, 81.
12. Oudot, J. *Mém. Acad. Chir.* 1951, **77**, 636, 642, 644.

in coarctation of the aorta—amply justify their continued use, although further observation may disclose a higher proportion of failures. As BROCK [10] has pointed out, "most of the conditions for which arterial grafting has been used, would soon prove fatal if they were not relieved by resection and homografting." The operation should perhaps be restricted to these rapidly fatal conditions until more is known about the eventual fate of the grafts.

Transfusion of Blood-platelets

WHEN a patient is bleeding owing to lack of blood-platelets, it would be very useful to stop the bleeding, even temporarily, by transfusing platelets. It might thus be possible to arrest cerebral hæmorrhage in a patient with idiopathic thrombocytopenic purpura, or to ensure a bloodless field for the surgeon doing a splenectomy in such a case. Commonly acute thrombocytopenic purpura is clinically severe and responds poorly to splenectomy; but if the patient could be tided over the acute phase by platelet transfusion he might recover spontaneously. The treatment of leukæmia and the reticuloses with mitotic poisons, such as mustine, is often limited by the occurrence, or the risk, of hæmorrhages. For reasons such as these, efforts have been made to raise the platelet-count by blood-transfusion; but until lately they have all failed. The reason is that blood-platelets tend to adhere to surfaces. Thus PAYLING WRIGHT [1] found that platelets adhere to glass surfaces and that anticoagulants, though they prevent platelets from sticking together, do not prevent adherence to glass. This stickiness of platelets has defeated all attempts at effective platelet-transfusion; even direct transfusions of fresh blood from donor to recipient have produced little effect, while transfusion of stored blood is wholly ineffective. In 1950, however, HIRSCH et al.[2] succeeded in raising the platelet-count of a patient by using syringes and needles whose inner surfaces had been coated with a silicone to render them not wettable. They used multiple syringes coated in this way to transfer 300 ml. of blood from a polycythæmic patient, whose blood contained 4 million platelets per c.mm., to a patient with thrombocytopenia; and the results were gratifying. Since then the technique of using siliconed metal or glass or non-wettable plastic materials has been extended; several methods for concentrating platelets for transfusion have been devised and much information obtained about their usefulness and limitations.

HIRSCH and GARDNER [3] used stainless-steel needles coated with 'Arquad 2C' (dimethyl-dicocoammonium chloride), syringes coated with silicone, and polyvinyl connecting tubing. Blood was drawn from a donor into 50-ml. or 100-ml. syringes and injected without delay into the recipient. It took 3–6 minutes to withdraw and inject the blood; no anticoagulant was used, but there was no clotting at all. Where possible the donors were polycythæmic patients with high platelet-counts; otherwise normal donors were used. HIRSCH and GARDNER gave to 23 patients 42 of these direct transfusions, and the platelet-count was raised significantly after all except 1; the rise varied from 30,000 to as much as 130,000 platelets per c.mm., and the proportion of platelets given that was recovered in the recipients varied from 20 to 100%. The effects were only brief, lasting never more than 6 days and often less. Platelet survival was longest in patients with aplastic anæmia; the lowest yields of platelets and the shortest survivals were in patients with acute idiopathic thrombocytopenia. In the more familiar chronic idiopathic thrombocytopenia yields were high, but the platelets did not survive very long. Clinically the results were striking: oozing of blood from wounds, gums, or needle punctures stopped at once, and in one case it was thought that intracranial bleeding had been stopped: the patient, who had been stuporose with blood in the cerebrospinal fluid, became conscious and rational within 12 hours after the platelet-transfusion.

STEFANINI and DAMESHEK [4] have reported similar results and explored other methods. They emphasise the necessity of having non-wettable surfaces throughout, and have also used a new anticoagulant—'Sequestrene-Na_2' (disodium ethylendiamino-tetra-acetate dihydrate)—which is said not to affect the functional efficiency of platelets. Besides direct transfusion, other methods have been used. Thus blood has been collected through plastic tubing into plastic bags containing acid-citrate-dextrose solution; or it has been collected into "plasma expanders," such as dextran, which cause sedimentation of red and white cells but leave the platelets in the supernatant plasma. Platelets can be separated from red and white cells by centrifuging blood at 4°C at 1000 r.p.m. for 15 minutes; they are then concentrated by centrifuging the platelet-rich plasma at 3000 r.p.m.; and finally the concentrated platelets are re-suspended in plasma or saline. In all these manipulations a surface-active agent such as 'Tween 80' is used to prevent irreversible agglutination of the platelets. Yet another method is to collect platelets on columns of an ion-exchange resin, from which they can be eluted by solutions of sodium citrate or sequestrene-Na_2. These techniques are ingenious, but STEFANINI and DAMESHEK found that in practice manipulation so reduced the survival of platelets after transfusion that they might just as well not have been given: the only two methods worth considering were direct transfusion by the multiple-syringe technique and collection of blood via suitable non-wetting apparatus into silicone-coated bottles or plastic bags. Results were best with polycythæmic platelet-rich blood. The platelets survived longest (for 4–5 days) in patients whose thrombocytopenia was secondary to diseases such as aplastic anæmia and acute leukæmia. In patients with splenomegaly platelet survival is likely to be short, and, disappointingly, survival in patients with idiopathic thrombocytopenic purpura may be for at most only a few hours—the more acute the case, the shorter the survival. Nevertheless, the clinical effects of platelet-transfusion persist longer than the survival-times, so that the troublesome bleeding from splenectomy for thrombocytopenic purpura can often be greatly reduced. STEFANINI and DAMESHEK have found another difficulty with platelet-transfusions: this is that repeated transfusions become progressively

1. Wright, H. P. *J. Path. Bact.* 1941, **53**, 255.
2. Hirsch, E. O., Favre-Gilly, J., Dameshek, W. *Blood*, 1950, **5**, 568
3. Hirsch, E. O., Gardner, F. H. *J. Lab. clin. Med.* 1952, **39**, 556.
4. Stefanini, M., Dameshek, W. *New Engl. J. Med.* 1953, **248**, 797.

less effective, the survival of platelets becomes very short, and the bleeding manifestations are no longer controlled. They have shown that this effect is caused by the development of platelet agglutinins, and there may be several platelet groups which differ antigenically. DAMESHEK and his co-workers [5] have described a case in which these platelet agglutinins were present; and they showed that the agglutinin, like other antibodies, is a globulin and is absorbed on to affected platelets.

All this means that for each patient the first platelet-transfusion is likely to be the most effective; and such transfusion should be reserved until the need is great—for example, to arrest cerebral hæmorrhage in a patient with idiopathic thrombocytopenic purpura, or to ensure a relatively bloodless field during splenectomy in such a patient. Platelet transfusions will not help to tide over the patient with acute idiopathic thrombocytopenic purpura, since only the first transfusion is likely to be effective. Despite these severe limitations, however, it is probably worth while for at least special centres to have the equipment for giving platelet-transfusions when they are really indicated.

Annotations

CIVILIANS AT WAR

ONE by one the ships of "Admiral" Sir Arthur MacNalty's fleet are built and launched, and eight stately galleons out of a fleet of nineteen now ride safely at anchor. The latest volume [6] of the Medical History of the Second World War covers the medical services provided by the Ministry of Health, including a section on the voluntary services; those of the Ministries of Education, Labour and National Service, Supply, and War Transport; and in the Channel Islands. A second volume will cover Scotland, Northern Ireland, the Colonies, and the Ministry of Pensions. Much of the ground has already been covered piecemeal in official reports, notably in Sir Wilson Jameson's *On the State of the Public Health During Six Years of War*,[7] but here it is expanded and collated as a more or less continuous narrative. The story is told almost entirely from the central and the administrative angle. More might have been said of the work of local authorities and general practitioners, and it might even perhaps have been enlivened, at least in footnotes, with some human incidents, as in R. M. Titmuss's *Problems of Social Policy* [8]; but in an official history, provided the milk is there, we should not expect too much cream.

The account of the problems involved in air-raid shelters, including the strange story of *Culex molestus*, is of great interest; and other excellent sections are those dealing with the mental health services, maternity and child welfare, tuberculosis, nutrition, and malaria.

All in all, it is a triumphant tale—even though many of the triumphs were disasters that did not happen. That our nation's health remained basically unimpaired and indeed improved in many respects, after six years of a war which involved civilians to a greater extent than any previous war of modern times, was due to a number of factors. Firstly, to a soundly based pre-war public-health and medical-care system. Secondly, to certain wise precautionary measures such as evacuation and the professional recruitment schemes, thought out and in some cases put into action before the crisis arose. Thirdly, to the devotion of denuded staffs and overworked doctors of all types: almost half of those recruitable had left the public-health services by the end of 1943, and the ratio of population to general practitioners rose from 2184 to 1 in 1938 to over 3000 to 1 in 1942 for more than half the population, and in some areas to 4500 to 1. Fourthly, to prompt and practical improvisations by the authorities in meeting emergencies such as the air-raid-shelter problems, the increase in venereal diseases and scabies, and the pollution of water-supplies after bombing. Fifthly, to advances in medical science such as the introduction of the persistent insecticides and the use of sulphonamides in the reduction of mortality from cerebrospinal fever. Sixthly, to the valour and skill of our fighting men who so often fought the Germans to a standstill just when a breakdown—of rest centres or of food-supplies, for instance—seemed inevitable. And lastly, to luck. There was no serious epidemic of any diseases such as influenza, whose ravages could have been neither prevented nor checked.

In his Harveian Oration of 1942, Sir Wilson Jameson [9] quoted Tennyson's definition of England and asked whether we could still afford to proceed "from precedent to precedent"? In time of war the answer was clearly that we could not, and this record is a monument to the successful abandonment of precedent by those concerned to protect our nation's health.

POSTVACCINAL ENCEPHALITIS

Two pressing questions confront the doctor when he sees a new case of encephalitis following a virus infection—treatment and prognosis. At present there is some hope of modifying the disease by giving corticotrophin (A.C.T.H.),[10] but confirmation of any substantial benefit is still required. The remote prognosis in the post-measles syndrome has lately been much clarified by Meyer and Byers,[11] and now Miller [12] has added to our knowledge of the outcome of the postvaccinal syndrome by a follow-up study of 27 cases, based on records of the Ministry of Pensions. The mortality was 30%, which is the generally accepted average figure; among 1¾ million personnel of the fighting Services vaccinated between 1941 and 1950, there were 10 cases (an incidence of 1 in 175,000) with 3 deaths. The degree of disturbance of consciousness is a guide to prognosis: there were only 2 survivors out of the 10 comatose patients in Miller's series, and only 1 survivor out of the 4 with convulsions in the acute stage. Clinically the disease was classed as pure encephalitis in 16 cases, as encephalomyelitis in 5, as transverse myelitis in 3, and as focal cerebral lesions without encephalitis in another 3. Of those who died, the patients in the encephalitic group succumbed early—within a matter of hours or a few days. Although organic neurological sequelæ were surprisingly common in the survivors, there was an astonishing capacity for recovery. Paraplegia, hemiplegia, radicular syndromes, dysarthria, epilepsy, and involuntary movements all tended to clear gradually. Few patients had any serious disability when they were re-examined after several years, and there was no instance of progressive nervous disease, except in a case of coincidental parkinsonism. The nature of the focal cerebral lesions is obscure; and there is a need for careful histopathological investigation of the occasional fatal cases of this syndrome. The most likely explanation is focal vascular thrombosis. The psychiatric sequelæ were less clear cut than in the postconcussion syndrome, but with the exception of 2 cases of gross hysteria, Miller found that steady improvement had been recorded in all patients. In psychiatric cases the desire for a

5. Stefanini, M., Dameshek, W., Chatterjea, J. B., Adelson, E., Mednicuff, I. B. *Blood*, 1953, **8**, 26.
6. Civilian Health and Medical Services. Vol. 1. Editor: Sir Arthur S. MacNalty, K.C.B., M.A., M.D., F.R.C.P., F.R.C.S. London: H.M. Stationery Office. Pp. 441. 45*s*.
7. H.M. Stationery Office, 1946.
8. London, 1950. See *Lancet*, 1950, **i**, 631.
9. *Lancet*, 1942, **ii**, 477.
10. *Bull. Hyg.* 1952, **27**, 397.
11. Meyer, E. Byers, R. K. *Amer. J. Dis. Child.* 1952, **84**, 543.
12. Miller, H. G. *Arch. Neurol. Psychiat.* 1953, **49**, 695.

pension may cloud the picture, but it is likely that severe brain damage may lower the resistance to environmental anxieties, and that secondary emotional mechanisms may thus play their part in prolonging the disability.

"COIN" LESIONS OF THE LUNGS

ISOLATED, well-defined, spherical shadows ("coin" lesion is really a misnomer) are often discovered during a mass X-ray survey. The patient usually has no symptoms, and believes himself to be in perfect health, so difficult questions of diagnosis, management, and treatment may be raised. Storey et al.[1] have lately published an analysis of 40 such cases in which the diagnosis was histologically verified. The patients were mostly healthy young men on active service, and 70% of the lesions were found to be tuberculous. In other published series the cancer-rate has been as high as 55%,[2] but the figures are bound to vary considerably with the method of selection. In 156 cases of solitary circumscribed lesions of the lung reported by Hood et al.[3] the mass was excised, and 35% of the lesions proved to be malignant.

Most of these shadows are cast by tuberculous foci or neoplasms, but a few are caused by cysts, various granulomas, infarcts, or vascular anomalies. During the past twenty years, preoperative diagnoses have become progressively less confident, and it is now generally accepted that the true nature of these shadows can seldom be established until the histological sections are examined. Indeed, many radiologists would agree that their opinion on the nature of the lesion is no more than guesswork. But this does not mean, of course, that radiology has nothing to offer in the investigation of these patients; for example, a few can be diagnosed as tuberculous with reasonable certainty. Wang[4] has recently described the X-ray appearances of 19 pulmonary "tuberculomas," pointing out the features which may lead to their recognition.

Tomography should always be added to the routine radiological examination, for by this method small cavities and flecks of calcification may be demonstrated within the shadow, and other small opacities or hilar-gland enlargement may be revealed. Recent developments[5] in the technique of tomography have enabled small bronchi to be displayed, and it is possible that the thickening of the bronchial walls, sometimes found in tuberculosis[6] would be demonstrated. Cavitation and calcification do not afford conclusive proof of tuberculosis, for quite small neoplasms may break down, and calcification is common in hamartomas; moreover, a small number of bronchial carcinomas arise in or around the calcification of old tuberculous scars. But in the series of Hood et al.[3] no lesion that showed areas of calcification visible on the radiograph was malignant. If more than one shadow is present, the likelihood of their being tuberculous is greatly increased, but multiple hamartomas or hydatid disease may occasionally cause difficulty.

Angiocardiography does not help to differentiate these various shadows[7] but recent work on necropsy specimens[8] has shown that there is an increase in the bronchial-artery supply to a primary neoplasm, and it is possible that a special angiographic technique may be developed to demonstrate these vessels. It is also known that some tumours, in other parts of the body, selectively absorb and retain radio-active isotopes, and this is another possible method of differentiation.

There seems to be little point in making an exhaustive search for a hidden primary growth, for small neoplasms so frequently escape detection, and in any case it is often justifiable to remove an isolated secondary deposit from the lung. Bronchoscopy should always be undertaken; for, although these lesions are usually out of sight, bronchial secretions or biopsy specimens of the mucosa can be examined, and occasionally a tuberculous bronchitis affecting the proximal bronchi may be seen.

When all these investigations have been completed, however, the answer is very often still in doubt. The safest place for these lesions is in the hands of the pathologist, and it is probably wiser to remove them all, tuberculous and non-tuberculous, except perhaps in patients under the age of 30 in whom the shadow lies at the apex of a lobe—i.e., in the posterior half of the chest—the usual site for tuberculosis. But any mass in the anterior half of the chest should be regarded with grave suspicion, for this is a very uncommon site for the isolated tuberculoma. A few of the single rounded tuberculous foci disappear spontaneously, sometimes after as long as five years, and this possibility suggests an alternative course of waiting, watching, and operating only if the shadow enlarges or excavates. In view of the safety of modern surgery, however, this course is seldom justified, and the advantage of increased certainty in preoperative diagnosis is likely to be offset by the number of cases that are later found to be inoperable.

MEDICINE AND PREVENTIVE MEDICINE

"THERE are fairies," we used to be mellifluously told, "at the bottom of the garden." At the bottom of the medical garden, where, some would say, public health could be found in recent years, there are certain heavings and stirrings in the compost heap of social and preventive medicine which has incorporated the small pile of manure now representing the older "public health." Three books lately published, from Cambridge, England, from New York, and from Cambridge, Massachusetts, have focused attention on these upheavals. Prof. A. L. Banks discusses the social aspects of disease, Dr. Iago Galdston is editor of a book on the epidemiology of health, and Prof. H. R. Leavell and Prof. E. Gurney Clark deal with preventive medicine.[1] The first two books receive notices in this issue. All three cover much common ground and, what is more remarkable, show a large measure of agreement on certain conclusions. These conclusions deal in the main with shifts of emphasis now perceptible, and they may be considered in relation to medicine as a whole and preventive medicine in particular.

A theme running through all these books is the emerging importance of diseases of the middle-aged and elderly, hence of the chronic diseases and the cancers, as compared to those of the young, which are principally infectious diseases. Coupled with this there is an increasing emphasis on the minor mental and emotional disorders and their relation to physical health. Concerned in this change, besides the earlier neglect and ignorance of these aspects of health and disease, is the swing of the pendulum towards a consideration of Man in relation to his whole make-up and his complete physical and social environment, away from the mere collection of clinical and laboratory data about his diseases—the so-called holistic or ecological approach. Also contributing to the new attitude is the change from a static to a dynamic approach, from anatomy and pathology, where things are, generally, what they seem, to the functional approach through physiology, biochemistry, and social medicine, in which the difficulty of isolating facts and the complicated interplay of factors are much greater. This leads us to the need for team-work and for a system of medical education that produces wise leaders, rather than brilliant technicians, whose techniques can,

1. Storey, C. P., Grant, R. A., Rothmann, B. F. *Surg. Gynec. Obstet.* 1953, **97**, 95.
2. Davis, E. W., Klepser, R. G. *Surg. Clin. N. Amer.* 1950, **30**, 1707.
3. Hood, R. T. jun., Good, C. A., Clagett, O. T., McDonald, J. R. *J. Amer. med. Ass.* 1953, **152**, 1185.
4. Wang, C. C. *Radiology*, 1953, **60**, 536.
5. Lodin, H. *Acta radiol. Stockh.* 1953, suppl. no. 101.
6. Clegg, J. W. In the press.
7. See leading article, *Lancet*, 1953, i, 1082.
8. Cudkowicz, L., Armstrong, J. B. *Thorax*, 1953, **8**, 152.

1. See *Lancet*, July 25, 1953, p. 170.

and to some extent must, be surrendered into non-medical hands. An elderly peer is said to have remarked that the only result of fifty years of free, compulsory education was that rude words were scrawled a foot lower on his front door. Similarly, for the doctor merely to master an increasing number of techniques may be necessary but is not enough. Finally, with the pushing back of the point of diagnosis earlier and earlier in the development of the morbid process, there is a growing preoccupation with health and with the arbitrary borderline between health and disease.

Applying these changes to preventive medicine, it seems that its scope is much less limited than is at present generally believed, not in the narrow sense of the public-health officer being the Master Mind with a finger in every pie, but in a still greater blurring of the line between preventive and clinical medicine, and a greater concern on the part of the clinician with the principles of prevention, as Sir Allen Daley emphasised in his recent Croonian lectures.[2] Thus, Leavell and Gurney Clark apply preventive action to all morbid conditions at five levels: (1) health promotion; (2) specific protection; (3) early recognition and prompt treatment; (4) disability limitation; and (5) rehabilitation; and three of these at least are, and must remain, in the province of the clinician. Again, surgery is constantly moving into new territories, but medicine with equal regularity takes over areas hitherto the province of the surgeon, as, for example, in the replacement of mastoidectomies by treatment with antibiotics; and then preventive medicine takes over in its turn, as when an army of occupation is replaced by the civil police. Thus, the rheumatic heart may now be restored by valvulotomy, but the damage may also be prevented by giving antibiotics to the rheumatic child.

In general, what seems to be needed is a fuller appreciation by the clinician that he is concerned as much with prevention as with cure. This would not be a new development but a return to the time before preventive and curative medicine parted ways. Dr. Richard Mead concerned himself with the details of quarantine, and Cushing says of Osler that "One cannot escape the feeling that Osler's greatest professional service was that of a propagandist of public health measures."[3] At all times the greatest clinicians have fought to prevent, by social, political, or medical action, the ills which they observe in their patients, and they have appreciated that prevention really is better—and usually cheaper—than cure. As Confucius might have said, "To the motor-cyclist a successful cranial decompression may be good, but a crash helmet is better."

BACKFLOW IN RETROGRADE PYELOGRAPHY

In retrograde pyelography, backflow, or the penetration of contrast medium beyond the confines of the renal pelvis, has been estimated to occur in anything from 4 to 25% of examinations. The importance of backflow during retrograde pyelography is that it obscures the outline of the calyces and renal papillæ and makes interpretation of the films difficult. It can be particularly troublesome when the question of early renal tuberculosis is being considered. Kohler[4] has lately reviewed, and has added to our knowledge of, this complication.

Earlier studies by Gigon,[5] in 1856, and Ludwig and Zawarykin, in 1863, had shown that in post-mortem kidneys and the kidneys of living dogs the contents of the renal pelvis, when subjected to pressure, passed into the renal vein. Marcus, in 1903, in experiments on rabbits, found that this took place through small ruptures in the calyces, and he assumed that the transfer was via the lymph channels. Lee-Brown[6] showed that in the kidneys of sheep, rabbits, and dogs, even under moderate pressure, the pelvic contents entered the renal vein through ruptures at the angles of the calyces, and Fuchs later demonstrated that the dye first entered the sinus fat before penetrating the venous system; it then extended back towards the hilum or along the perivascular sheaths of the interlobular veins. Kohler has now carried out manometric experiments from which he concludes that the pressure applied to a no. 6 catheter by a syringe reflects fairly reliably the pressure in the renal pelvis; and he describes his findings in 27 patients in whom he performed retrograde pyelography and recorded the pressure in the syringe. He found that backflow occurred in 4 cases at pressures of 60 mm. Hg or less and in 14 cases at pressures of 80–100 mm.; while in 3 there was no backflow even at pressures of 200 mm. Hg. Patients with clinically normal kidneys usually felt tension in the renal area when the pressure rose to 40 or 50 mm.; at 80 mm. there was considerable pain, which became intolerable at between 120 and 150 mm. On the other hand, patients in whom no backflow was seen had no discomfort even at 200 mm. It is often held that a sudden increase of pressure would tend to produce calyceal rupture and backflow, but Kohler was unable to confirm this. He stressed that pain was not a reliable guide to the state of filling of the renal pelvis during retrograde pyelography. When he mixed fluorescein sodium with the contrast medium, only 3 patients in the series showed definite fluorescence of the lips and conjunctiva under ultraviolet light, and in these cases pressures of over 150 mm. were used. This suggests that slight and moderate backflow at low pressures is in no way connected with the venous system of the kidney. At high pressures, pyelovenous backflow may occur, but not show itself on the radiograph because of the fairly rapid venous flow diluting and dispersing the contrast medium. On the basis of his observations, Kohler divides backflow into three types: (*a*) sinus extravasation; (*b*) pyelotubular backflow, where the pelvic contents penetrate the renal parenchyma along preformed channels; and (*c*) a mixture of the two.

Kohler has also examined the results of 628 routine retrograde pyelograms, of which 321 were bilateral. Backflow was seen in 154, of which 53 were bilateral; and 122 fell into group (*a*), 66 into group (*b*), and 19 into group (*c*). The whole kidney was involved in 158 cases, the upper and lower poles in 47, and the central part in only 2. Sinus extravasation showed itself as irregular woolly collections of contrast medium, spreading out from the margins of the calyces into the sinus fat. If they were seen end on, the extravasations seemed to be separated from the calyx by a halo 1 mm. thick, which may represent a vein or the wall of the calyx. Several calyces were usually involved at the same time. The medium may extend backwards to the hilus or along the perivascular connective-tissue spaces to the periphery of the kidney. In most cases, there was no penetration of the veins, in contrast to the post-mortem findings. Some kidneys showed, in addition to sinus extravasations, streaks of dye, $^1/_2$–2 mm. wide, which were tortuous and sometimes confluent. Their position coincided with that of the lymph channels. There was no reason to suspect that these streaks indicated the filling of venous channels, for they persisted for some time, perhaps three to five minutes, and there was no fluorescence at all in those patients who were tested. Pyelotubular backflow began at the middle of the calyx, forming a wedge-shaped opacity which widened out towards the cortex. Rarely the wedge may reach the edge of the kidney shadow. The shadow may be homogeneous or faintly striated. In the presence of hydronephrosis, all instances of backflow were of this tubular type.

2. *Brit. med. J.* 1953, i, 163, 243.
3. Cushing, H. The Life of Sir William Osler. Oxford, 1925; vol. II, p. 231.
4. Kohler, R. *Acta radiol., Stockh.* 1953, suppl. 99.
5. Gigon, C. *Un. med.* 1896, **10**, 297.
6. Lee-Brown, R. K. *J. Urol.* 1927, **19**, 105.

Venous backflow undoubtedly occurs, but it must be comparatively rare, and is unlikely to be visible on the film, if for no other reason than that the blood-flow through the pericalyceal veins dilutes and disperses the medium. The arch-shaped streaks, sometimes seen running between the calyces, probably represent no more than penetration of the dye into the perivascular sheaths. In Kohler's series, there was only 1 case in which there was any suggestion of filling of the renal veins. His view is that most of the published cases are, in fact, examples of lymphatic spread.

THE MUSCLES IN MYASTHENIA GRAVIS

LYMPHORRHAGES, or accumulations of lymphocytes in muscle and other tissues, were so named by Buzzard [1] in 1905, though they had earlier been observed by Weigert,[2] who regarded them as metastases from a "lymphosarcoma" of the thymus. Buzzard believed that they were caused by an outpouring of cells from the capillaries. He noted that a capillary was often to be seen close to them, and in one instance the vessel was distended with leucocytes, chiefly lymphocytes, some of which appeared to be escaping. The significance of lymphorrhages has so far been uncertain, for not only are they found in myasthenia gravis in clinically unaffected muscles as well as the myasthenic ones, but also in the muscles of people suffering from other conditions, notably Graves's disease and Addison's disease; and they have also been described in various rheumatic disorders. Moreover, lymphorrhages were found by Buzzard not only in the muscles but in the heart, liver, adrenals, and thyroid of patients with myasthenia gravis. Nevertheless their presence in muscle has for some time been commonly associated with myasthenia, and in particular with a disorder of thymic function. It seems, however, that lymphorrhages may be readily confused with cellular infiltrations due to various causes.

Closer study of the muscles by Prof. Dorothy Russell [3] has now shown that in myasthenia gravis there are other significant changes. A coagulative necrosis with accompanying phagocytosis, for instance, is sometimes widespread, causing obvious diminution in the number of muscle fibres, and this lesion was seen in the muscles of 6 out of 8 patients examined. It was significant, too, that the lymphorrhages often arose close to atrophying hæmatoxyphil fibres which had lost their normal cross-striations. Sometimes, however, there was a simple atrophy of fibres with retention of the normal eosinophilia unassociated with cellular reaction. These three changes —coagulative necrosis, atrophy with cellular reaction, and simple atrophy—were found singly or in combination in muscles such as the diaphragm, those of the upper alimentary tract, and those in the extra-ocular group, where disuse atrophy could be excluded with reasonable certainty. The type and distribution of the lesions seemed to have no connection with a thymic tumour, but there was a possible correlation between the disturbance of function and the pathological changes. They were seen, too, in likely situations in those cases with bulbar dysfunction—in the tongue, palate, pharynx, and upper œsophagus. Buzzard himself noticed that there were other changes in the muscles, and he described a homogeneous and hyaline sarcoplasm, pericentral vacuolation, and changes in the refractive properties of the central portions of the fibre, reminiscent, as he pointed out, of the earliest stages of certain forms of muscular atrophy. In one case he described protoplasmic disintegration of the muscle fibres and "independent cellular reaction." He thus found a structural basis for the wasting which he had observed.

The lymphorrhages described by Dudgeon and Urquhart [4] in 9 cases of exophthalmic goitre, including 1 with myasthenia, were often seen close to small blood-vessels, and there was often a chronic interstitial myositis with atrophy of the muscle fibres. A similar atrophy of muscle fibres was commonly found near the large lymphorrhages.

Russell points out that there is a distinct difference between the lymphorrhages of myasthenia gravis and the cellular infiltrations found in the rheumatic diseases and recently described by Cruickshank.[5] In myasthenia they are confined, in her view, to the striped muscles, for she thinks that the aggregations of lymphocytes described by Buzzard in the adrenal and liver are of no significance because they are found in a wide range of necropsy material. In the rheumatic diseases, however, they are also to be seen in relation to blood-vessels and nerve-fibres, while plasma cells, rarely if ever seen in myasthenia gravis, often mingle with the lymphocytes. On the other hand, in rheumatoid arthritis muscle-fibres are also to be seen undergoing necrosis, and the same thing happens in Weil's disease and other toxæmias. Professor Russell concludes, therefore, that the changes in myasthenia gravis are not specific, but that they have much to do with the muscular weakness.

It is interesting that in 3 out of 6 of her cases the myocardium was involved; coagulative necrosis was the characteristic lesion, no lymphorrhages being noted, although they had been previously described in the heart in myasthenia. This finding is of some importance, for these patients are liable to die suddenly and electrocardiographic abnormalities have been reported.[6]

PHYSICAL THERAPY CONGRESS

THE planning and conduct of an international congress is a great responsibility at any time and especially when it is the first meeting of its kind. The inauguration of the World Confederation for Physical Therapy on Sept. 8, 1951, was due to the initiative of the Chartered Society of Physiotherapy of Great Britain, and not unnaturally it fell to the same body to organise and act as host to the confederation's first congress which was held in London last week. British physiotherapists are to be congratulated on a highly successful meeting which brought together physiotherapists—or, to use the international terminology, physical therapists—from 25 countries, under the presidency of Miss Mildred Elson, of the American Physical Therapy Association, and the chairmanship of Dr. James Whillis, professor of anatomy in the University of London and chairman of the council of the Chartered Society of Physiotherapy. Mr. Iain Macleod, Minister of Health, reminded the congress that physiotherapy had become an integral part of most branches of clinical medicine, and he emphasised the importance of seeking not only to restore function but also to return patients as fit as possible to their rightful place in the community. Miss Elson declared that the object of the congress was to determine how physical therapy could best contribute to the total rehabilitation of the patient, and this became the dominant theme of the week.

The treatment of poliomyelitis, in which physiotherapy plays so large a part, was an opportune subject for the first scientific session. Here Mr. H. J. Seddon surveyed recent developments in treatment: in the present state of our knowledge, he advised a middle course between rest and activity, and he drew attention to the unsubstantial scientific basis on which many of the procedures, widely accepted today, were based. In the provocative paper that followed, Dr. Herman Kabat, medical director of the Kabat-Kaiser Institutes in the U.S.A., advocated vigorous re-education, using physiological patterns of movement in preference to graduated exercise for each weak muscle. This suggestion started a controversy which is likely to continue for a long time

1. Buzzard, E. F. *Brain*, 1905, **28**, 438.
2. Weigert, C. *Neurol. Zbl.* 1901, **20**, 597.
3. Russell, D. S. *J. Path. Bact.* 1953, **65**, 279.
4. Dudgeon, L. S., Urquhart, A. L. *Brain*, 1926, **49**, 182.
5. Cruickshank, B. *J. Path. Bact.* 1952, **64**, 21.
6. Katz, L. N. Electrocardiography. London, 1946; p. 479.

to come and will no doubt lead to a much needed re-examination of the established techniques of treatment in poliomyelitis.

Other scientific sessions, to which doctors and physiotherapists contributed, dealt with physical therapy in the rheumatic diseases, disorders of the chest, and the conditions encountered in industry. In a particularly valuable session devoted to physiotherapists' views on treatment and research, the scientific standard of the papers was well matched by the excellence of the practical demonstrations. Two afternoons were spent in study visits to 25 hospitals, clinics, and rehabilitation centres in and around London. Each delegate had the choice of two distinct and well-organised programmes. Some 1600 people attended the congress, of whom nearly a quarter were doctors and physiotherapists from overseas. The comprehensive arrangements included scientific and trade exhibitions. In the scientific exhibition the Central Council for the Care of Cripples, the British Red Cross Society, the Canadian Department of Veterans' Affairs, the Association of Occupational Therapists, and other organisations, hospitals, and clinics in this country and abroad demonstrated a large number of devices to help the disabled to overcome or minimise their disabilities. The trade exhibition included much new physiotherapy equipment and was notable for the number of firms exhibiting for the first time apparatus and appliances for the disabled, many of them based on prototypes shown in the scientific exhibition. Both exhibitions thus emphasised the move towards the more complete reablement of the disabled that had been evident at the scientific meetings.

EMPLOYMENT OF THE DISABLED

THE policy of full employment, so well imagined by Lord Beveridge, and for a time so thriving, is beginning to shrivel a little in the economic wind; and the disabled are inevitably among those affected. At the end of 1951, of some 895,000 on the disabled persons register less than 48,000 (just over 5%) were unemployed; in December, 1952, of some 875,000 on the register over 60,000 (nearly 7%) were unemployed. The numbers of those who needed, and had failed to find, sheltered employment remained steady over the two years at about 7000; so the greater difficulty in finding work has been experienced chiefly by those registered as capable of ordinary employment. We can, of course, congratulate ourselves that well over 90% of our registered disabled are in work; and indeed this is probably a unique achievement in the world today. But our congratulations might be warmer if we could feel confident that these disabled people were engaged in work for which they were fit. The Ministry of Labour report for the year 1952,[1] from which the above figures are drawn, gives no information on this point, but we know from the Medical Research Council memorandum on the problems of disabled youth in Glasgow,[2] published last year, that there is some reason for disquiet, anyhow as far as young people are concerned.

The unemployment-rate among these youths was higher than among normal boys of the same age-group, and the proportion in non-manual work and in skilled and semi-skilled work was lower, while the proportion in unskilled manual work, often heavy in its physical demands, was twice as high as in normal youths.

Many of these disabled young people, in fact, were doing work far beyond their physical capacity—for example, some with cardiac disease or tuberculosis were doing heavy manual labour. Of those registered under the Disabled Persons (Employment) Act only 26% were receiving suitable training—22% as apprentices to various callings and 4% at Ministry training courses.

It is not possible to tell, from the Ministry's report quoted above, what proportion of the whole group of registered disabled take training courses. During 1952, 4374 people (3555 men and 819 women) completed a course, and the number placed in employment soon after the end of their course was 3555. The Government offers training in a very wide variety of occupations—listed in the report, and ranging from civil engineering to wig-making—and the flow of applications in 1952 was steady, and decidedly higher than in 1951. Training courses for one or two trades (notably watch- and clock-repairing and retail tailoring) were reduced because opportunities for employment had fallen, but additional courses were provided in other trades, particularly engineering. Only 237 applied for grants for professional training in 1952, compared with 285 in 1951; and only 90 grants were made instead of 109. Applications, the report says, were dealt with sympathetically, but "it is a basic condition that training for a professional qualification is appropriate and necessary for, and likely to lead to, the disabled person's resettlement"; and in nearly half the cases the need for such training could not be established. Most of the grants made were for training for such professions as accountancy, auctioneering, estate agency and surveying, engineering, law, the medical auxiliary professions, and teaching. The quota scheme, under which employers of 20 or more people are required to employ a quota of disabled persons, is working well, and there has been no serious failure to comply. Government offices are exempt from the ruling, but they have undertaken to abide by it and in 1952 were employing 5·3% of disabled persons, though the Act only requires 3% to be employed.

Reablement courses for those recovering from injury are still giving good results. Of 8244 men and 902 women admitted during 1952 (including 248 men and 42 women who were not disabled people) 6944 men and 747 women completed courses; and of these 72·6% were placed in suitable employment or started a course of training which would lead to employment. During the year, the Watford Industrial Rehabilitation Unit closed down (reducing the number of units from 15 to 14), and the Government training centre associated with it was also closed. Four other Government training centres (at Coventry, Felling, Sheffield, and Edinburgh) shut down during the year; but in these places it was possible to retain the non-residential rehabilitation units, which are now operating without the support of training centres. This is a new departure, and presumably it will be possible to tell next year whether it has been successful. These reductions have not been made merely on economic grounds: as we travel farther from the war years the numbers of disabled in the country are decreasing. In 1952 they had fallen to 875,043—a decline of 20,577 from the numbers in the previous year. Civil injuries, congenital deformities, and crippling diseases are always with us, however; and there is much we can yet do to perfect our service for those who have to go through life with a handicap.

1. Resettlement of Disabled Persons, 1952. Cmd. 8893. H.M. Stationery Office, 1953. Pp. 18.
2. Employment Problems of Disabled Youth in Glasgow. M.R.C. memorandum no. 28. H.M. Stationery Office, 1952. See *Lancet*, 1952, ii, 120.

Prof. A. RENDLE SHORT, emeritus professor of surgery at Bristol, died on Sept. 14 at the age of 73. We also regret to record the death of Mr. V. H. ELLIS, orthopædic surgeon to St. Mary's Hospital, on Sept. 15.

THE INDEX and title-page to Vol. I, 1953, which was completed with THE LANCET of June 27, is published with our present issue. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

Reconstruction

GROUP PRACTICE *

WHAT NEEDS TO BE DONE

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IN my first article I discussed the different ways in which group practice is developing, and I suggested that the form most likely to solve the problems of general practice in England was what I call Basic Group Practice—a working and financial association of several general practitioners sharing a small medical centre.

Today group practice and health centres are being widely discussed, but the discussion is mainly theoretical and is set against a background of traditional single-handed general practice. All forms of organisation are regarded with distrust, and many people believe that even the simplest form may destroy the intimate relationship of the patient and his family doctor.

The average doctor is also distrustful of the local authority as a dispenser of medical care, particularly of the so-called personal services conducted in the name of public health. It was hoped that a meeting-ground for these local-authority services and the general-practitioner services would be found at the health centres. But experience in London and Edinburgh (Woodberry Down and Sighthill) is so far hardly encouraging. Assuming the most wholehearted enthusiasm of general practitioners for this way of practice—and this can hardly be claimed—we should still have to face the fact that these two prototypes provide facilities for under twenty general practitioners at a capital cost of about £240,000—which is neither realistic nor economically sound.

While so much earnest, but mainly theoretical, attention is being given to this problem, the experience of many excellent working examples of basic group practice seem to be ignored. These practices are scattered through many parts of the British Commonwealth and the United States and they stand as fertile islands of progress in a huge and long-stagnant ocean. They are to be found in many differing and often improbable places—the bayous of the Mississippi, a little Cornish village, an outback area of New Zealand, a Baltimore slum, or a residential part of London. They are usually the result of one doctor's determination to beat the universal enemy of all good general practice—time. They are all based on common principles, though they have originated spontaneously, sometimes thousands of miles apart, in diverse national, social, and economic environments, under the leadership of men with a great range of medical training and widely differing backgrounds and personalities. During the last seven years I have studied many of these practices, and it seems to me that some important principles emerge which are applicable to general practice in Britain today.

Aims

There is a tendency to believe that a sound financial partnership agreement among doctors working from common premises is synonymous with group practice, or that if a number of independent general practitioners have their surgeries under a common roof and use the same nurse and receptionist (as at Woodberry Down and Sighthill) group practice will somehow develop spontaneously.

Nothing could be further from the truth. These kinds of arrangements have often gone on for years without true group practice developing. A partnership agreement and common premises are undeniably important ingredients of group practice, but alone they are not enough to transform the facsimile of group practice into a working reality.

The aims of basic group practice are identical with those of ordinary general practice. The primary aim is to provide patients with the highest level of diagnostic and therapeutic service attainable outside hospital, to inconvenience the patient as little as possible, and to preserve the best elements of personal service—all at a cost the patient (or better the community or nation) can afford.

Important corollaries to this aim include: the need to release the doctor from his bondage of continuous patient service, and give him the opportunity and time for reading and study; the need to tap the as yet almost untouched resources for research which general practice offers; and the need to develop new teaching approaches to shift the emphasis of medical education from the mechanisms of medicine back to the patient as a person. But top priority should be given to the provision of a first-rate clinical and personal medical service. From this all else will follow, and only on this foundation can sound research and teaching be based.

Staffing

It is primarily people, and only secondarily buildings and equipment, which assure good medical service. When we think of hospitals or public-health services, we think of a regular army of doctors, nurses, secretaries, and other essential workers. When we think of general practice we think of a doctor alone. In discussions on group practice and health centres the term "auxiliary workers" is often thrown into the conversation. This awkward term is a sign of muddled thinking, for it is possible to decide how many nurses, secretaries, and technicians are needed by how many doctors to run a satisfactory basic group practice.

The ideal number of doctors is probably five. In a group of this size none of the personal contacts of general practice, as we know it today, are lost. The depersonalisation of medical service is more likely to be caused by having too many doctors (and other workers) in the team, than to their caring for too many patients (unless this number be grossly excessive). With large teams of medical workers it is impossible to avoid an institutional approach to individual problems. True group practice is possible with as few as two doctors, or even one doctor with "auxiliary workers," and perhaps as many as six or seven. But experience points to five as the best number of doctors for groups of this kind.

In the United States doctor-patient ratios are used widely, if unrealistically, as an index of satisfactory medical service. The ideal ratio is held to be about 1 general practitioner to 1000 patients. This standard is both impracticable and undesirable. It will not provide the general practitioner with a living income (at least outside the U.S.), and it will not offer him enough clinical material to maintain and develop his clinical skills. Owing to the emphasis now placed on psychological medicine it is argued that the general practitioner cannot act as family counsellor to more than this number of people. Be this right or wrong (and in my opinion it is quite wrong), such a ratio is out of the question. At the other extreme, a ratio of 1 general practitioner to 4000 patients is equally bad. In a well-organised basic group practice the right figure is probably 1 doctor to 2500 people. A doctor can look after the medical need of this number properly and give reasonable time to their psychological problems.

A five-doctor group can find a wealth of clinical material in a population of 10,000–12,500. From such a population they can also earn a satisfactory livelihood,

* A previous article appeared on July 4, and a concluding article will be published later.

either under the terms of the N.H.S. or on any reasonable basis of remuneration.

What auxiliary staff does a five-doctor group require? The absolute minimum is the equivalent of two and a half full-time people, comprising one full-time nurse, one full-time secretary-receptionist, and a half-time person who can take on either job.

But the ideal team would be two nurses and two secretaries (one serving as receptionist) and the equivalent in part-time help of another person, who can take on any of these jobs. The group could also usefully employ (at least part-time) a physiotherapist, a social worker, a health visitor, and perhaps a laboratory technician. However, these are luxuries rather than necessities.

One of the nurses should be fully trained, though good work is possible with "practical nurses." At least one of the secretaries should be a competent shorthand-typist. The need for a laboratory technician depends on the local laboratory facilities. If only routine urine analyses need to be done at the centre, the nurse can usually cope: if blood microscopy and simple radiography need to be done at the centre, a person well trained in these procedures is essential. Such X-ray and laboratory facilities should only be contemplated in the absence of these facilities elsewhere in the area of practice.

There is no doubt that the heart and soul of group practice are the people composing the group. All else, however important, is second to a sound working (as distinct from financial) association between the members of the team. It is easy to develop, with the best intentions in the world, a pseudo or semi group practice which has all the outward appearance of a group practice, but is really little more than a number of doctors sharing staff, accommodation, facilities, expenses, and income, but remaining (so far as professional association goes) almost as dissociated as if they worked from separate premises.

Partnership Agreement

To survive and work effectively every group must have a leader and must operate within an agreed constitution. This means much more than a legal agreement dealing with the earnings of the partnership. All the important constitutional points governing the group should be legally drawn up. This is only a reasonable safeguard for each member, however harmonious may be their personal relations.

The leader of the group may be selected automatically. He may be the "old senior partner," or a member who started the scheme. But a recognised and appointed leader there must be. Members wishing to try their hand might take turns at being leader until a final choice is reached. The title of the leader is unimportant but it should clearly designate his status.

If harmony is to be maintained it must be firmly established that *all* professional earnings, from whatever source, shall be pooled and redistributed on a collective basis. If such an agreement cannot be reached, statutory limits as to how much time may be spent on work outside group activity should be laid down. But pooled earnings are by far the most satisfactory precaution against ill-feeling.

Holidays and study leave for all group members (doctors and others) should be clearly defined and adhered to. Provision should be made to pay fees for postgraduate courses, journal subscriptions, medical society membership, and so forth out of group funds. How often business and clinical meetings should be held should be part of the constitution, and a penalty clause for non-attendance is a useful incentive.

Baldly set down like this, the constitution for a group looks somewhat grim, and suggests too much bureaucracy for what must be a sound personal relationship. But these are not minor administrative tyrannies, but safeguards against unnecessary clashes in an intimate working association. The senior non-medical members of the group should be given at least ex-officio status in group council.

Lay-out of the Centre

With a good team it is possible to practise good medicine in tents or any other form of shelter against the elements. But the design of the building which houses the team can increase efficiency. If a medical centre is to be built from the ground up, the architectural possibilities are almost limitless; but if premises are to be converted, limitations are imposed on architectural flights of fancy. Anyhow the limits set by cost will usually frustrate the architect long before he has exhausted his creative talents.

In present circumstances, conversion is more likely to be the order of the day than new construction. One-storey premises are easier and cheaper to convert, and greatly preferable to two-storey or higher buildings. Wooden structures are more adaptable than brick or concrete. An efficient group practice will require the following accommodation (see figure):

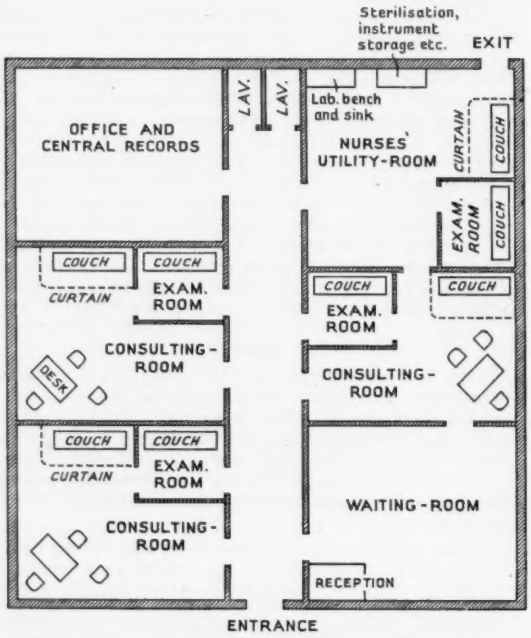
1. A receptionist's desk should command a good view of the entering patients and allow her to direct them easily to their appointments.

2. A group of five doctors will need at least three consulting-rooms and eight examining-rooms (or the equivalent in screened-off couches), two or three of which should be in the nurses' room.

3. The examining-rooms need only be big enough to take a couch and give space for undressing. Separate dressing-rooms or cubicles are unnecessary.

4. One medium-sized (15 ft. by 20 ft. approx.) waiting-room. If this form of group practice is efficiently run a fifteen-minute appointment system is possible, and the waiting-room need never be crowded.

5. A nurses' utility-room. As this form of practice develops and proper utilisation of nurses' services is worked out, it will be found that the ratio of nurse services to doctor services may be as high as 3 : 1. It is only by making full and proper use of nurse services that a satisfactory appointment system for the doctors can be adhered to.



Minimum requirements for basic medical centre (diagrammatic).

The nurses' utility-room will rapidly become the centre of group operations and should be planned very carefully. All instruments, &c., needing sterilisation will be distributed from here to consulting- and examining-rooms. Here also will be done much of the therapeutic and casualty work, some of the antenatal work, and such laboratory work as is necessary. A second exit near this room will save traffic in the corridors.

6. A small office for secretarial work, filing records, and so on is very necessary. Records should not be kept at the reception desk, nor should telephone arrangements for hospital admissions, &c., involving discussion of patients' illness be made there.

A screened couch in the consulting-room is useful for short examinations, which need not unduly tie up the consulting. In the examining-rooms (or couches in their room) the nurses can prepare for examination or treatment casualties or other patients who they think should be seen by the doctor though they have no appointment. Here, too, the doctor can send patients from his consulting-room to be prepared for specific examination or treatment.

If the space permits, a small physiotherapy room next to the nurses' room and controlled by a nurse (strictly on an appointment basis—appointments to be made by the nurse in charge) can be used for treatments recommended by the doctors. With no more than a short-wave machine and a heat lamp, fifteen or twenty people can be treated every day without disorganising or overstraining the nursing service. But a physiotherapy room which is at some distance from the nursing station can cause great disorganisation to the more important nursing services and is not justified unless there is an abundant nursing staff or the group employs a physiotherapist.

A small bench, sink, common reagents, test-tubes, bunsen burner, microscope, and hand centrifuge are all the laboratory facilities required, unless blood tests are to be done. The nurses can test for albumin and sugar and can set up slides for examination by a doctor. Routine urine analyses make little demand on time.

Two water-closets for patients are desirable, but one will suffice. They should, if possible, be near the nurses' room, and there should be a small box, accessible from the outside, in which urine specimens can be left. The patient should not have to walk around the medical centre carrying a urine specimen in his hand.

In few places in Britain today should radiological or more elaborate laboratory facilities than these be necessary in these small medical centres. Where they are needed, they must of course be provided, but they should never be planned on a level beyond the skill of the doctors who must use them.

If there is enough room, a staff conference room or common-room is a great advantage.

In converting premises of different types and vintages the cost usually depends largely on the state of the original, often antique, plumbing, but highly improbable buildings can be adapted where careful thought is given to the doctor's convenience and the patient's comfort and welfare.

Equipment and Records

A medical centre needs no more equipment than any well set-up surgery. Apart from the instruments which are continually in use in the consulting-room or at the bedside, three sets of instruments will usually meet the needs of a five-doctor group.

As little apparatus as possible should be kept in the consulting-room. Specula, rubber gloves, and the like should be kept where they are sterilised, probably in the nurses' room, and should be called for when needed. Sterilisers in each consulting-room are not necessary. An ordinary household pressure-cooker and one electric well steriliser is all that is needed even in a busy practice.

Movable-stand mercury manometers in each consulting-room and in the nurses' room save all the trouble of levelling and balancing the usual box-type of manometer. One microscope will serve the needs of a five-doctor group.

I have not tried to go into details of equipment, but the above points show how a group can achieve economy and coöperation. They also give some idea of the capital cost of equipping a small medical centre.

Medical records are as much a part of a doctor's equipment as his stethoscope or syringe. Records should be in one place under the care of one person.

With an appointment system the patients' records can be placed on the doctor's desk before his consulting-hour. He can glance through them before the patients arrive and can tell the nurse what he is likely to need.

All medical records should be first and foremost an instrument to serve the patient, and only secondarily an instrument of administrative convenience or even research. The N.H.S. record forms are designed primarily for administrative purposes, which limits their value for patient and doctor. The first essential of any good record is enough paper for the doctor to write down his observations, and this should be the starting-point in planning any system of medical records for general practice. Blank sheets of quarto or foolscap paper with identification data headings filed loosely under the patient's name in folders into which all consultation and laboratory reports can be inserted is a good starting-point. Two three-drawer filing cabinets will be enough for a practice of this type and size.

Most doctors, given the time and opportunity to write records, develop their own technique, and in group practice of this kind the evolution of a sound and satisfactory record system is usually automatic. This evolutionary approach is much better than trying to install elaborate preconceived systems, which call for a big break with traditional practice. Only when good record-keeping becomes the rule and not the exception will general practice make its full contribution to research.

Organisation

The biggest single advantage of basic group practice is the defeat of the enemy, time. The advantage of a fifteen- or twenty-minute appointment system, for patient and doctor, is enormous. The next most important advantage is the opportunity for many consultations between members of the group, with their obvious benefits of mutual education, review of more clinical material, and reduction in the number of outside consultations.

A successful appointment system depends almost wholly on using the nursing service properly. As I have already indicated, the ratio of nurse services to doctor services may be as high as 3 : 1 without the patient losing any essential doctor contact.

This calls for efficient capable nurses and a well-planned nursing service available to patients throughout the hours the centre is open. The nursing service should run on a walk-in basis. With an efficient appointment system a waiting-room big enough for 10–15 people is all that is necessary. Usually there should not be more than 4–5 people in the waiting-room, and most of them will be waiting for nursing services. As the waiting-room is small it can be bright and friendly as in any well-set-up surgery. There is no need for any "clinic" atmosphere to creep into a waiting-room for a practice of this size.

It is most important to have a mature and efficient receptionist. Besides arranging the appointments she can make a very positive contribution to patient care. She often receives confidences from patients and she can help the doctors and nurses.

To benefit fully from inter-group consultations careful attention must be paid to what at first seem minor points of organisation.

At least three doctors should work at the centre at the same time—better still all five. There are few drawbacks to the whole group having surgery hours at the same time, though it may seem a little unconventional, and they are certainly outweighed by the advantages. If

the whole team work at the centre at the same time the building and the capital cost will be bigger. But if the money is available the aim should most certainly be five-doctor premises for a five-doctor group. The three-doctor premises I have described are a concession to economy.

A well-planned system of communications between all the rooms in the centre makes for easy inter-group consultation. It is false economy to save on these communications. There should be room-to-room direct telephone communication (push-button type, not going through the switch at the reception desk). Only with this room-to-room communication system is it possible for Dr. A to request a brief and prompt consultation with Dr. B, who can usually manage to free himself for a few moments without unduly upsetting his own routine. This habit of consultation breaks down if busy nurses have to be summoned to call for one or other of the doctors, who may be engaged with a patient, or if one doctor has to leave his room to seek out a colleague. Each consulting-room should also have an ordinary telephone for incoming and outgoing calls controlled by the switchboard.

There should also be a light-and-muted buzzer call-system (as well as direct telephone) from each doctor's room to the nurses' room. This is often time-saving for nurse and doctor and preferred to the telephone when all that is required is the nurse's presence.

Regular clinical and business meetings are essential and should be planned systematically. This is but one of the important duties of the group leader. Through these meetings policy develops and standards of work are established.

In a group of this type a duty rota allows ample free evenings, weekends, and study leave. So long as patients can be sure of seeing their own doctor during his regular surgery hours they readily accept another member of the team when he is off duty.

Groups of this kind doing good work have little difficulty in persuading consultants to meet doctors at the centre to consult on selected patients. The consultants most commonly called for are the physician, the psychiatrist, the pædiatrician, the gynæcologist, and the orthopædic surgeon. Consultants usually take a keen interest in this work, which is not always obvious in their approach to either outpatient work or the individual general practitioner. A group has a great deal to offer the consultant which the individual doctor is rarely in a position to offer.

Discussion

The resistance of a large section of the medical profession to any form of organisation of general practice is usually proclaimed in the name of preserving the intimate, personal service characteristic of general practice today. It is coloured by fear of the patient's reaction to breaks with tradition, and by the reluctance of many doctors to make such breaks. It is further complicated by fears that all forms of organisation constitute a threat to the independence of the individual practitioner. In fact basic group practice demands few breaks with traditional general practice; indeed it is the only way to breathe life back into some of the finest, dying elements of this branch of medicine. It makes it possible for general practice to become in fact all it claims to be in theory—an effective first line of defence for each citizen against all the common (and some not so common) hazards of illness and injury, and the focal point to which they may bring their personal problems.

Efficiency is the most effective safeguard of the status of the general practitioner. His independence is threatened by a performance that seems inadequate compared with other branches of modern medical practice, whether these be specialist services in the hospitals, or public-health clinics under the local authorities. In the United States he is also menaced by the threat of over-organisation (as discussed in my previous article), which can put general practice into eclipse, perhaps for all time. These challenges to general practice come principally from within the profession. The formation of a College of General Practice, postgraduate courses, and diplomas will all help to raise the standards and status of the general practitioner. But only a reorganisation of his work on the lines I have described will permit the average doctor to use with greater advantage the skills already at his command.

How do patients react to basic group practice? Is there any substance to the fear often expressed by doctors that patients will resent any change from the present methods of individual practice? Patients seem to like these small group units which avoid any clinic atmosphere. In a small group there is no need to "pass patients around." Each doctor can keep his own list of patients as he does at present. For the patient the opportunity to see his doctor by appointment and for an adequate time more than offsets the fact that he may have to see another member of the group in an emergency or when his own doctor is off duty. In the same way a full and intelligent use of the nursing service is appreciated rather than resented by patients.

In the group practices I have studied in Australia, Canada, New Zealand, and America patients remain strongly attached to their own doctor, and yet transfer their faith to the group. There is no reason to suspect that the people of Great Britain will react differently. Some groups run patient forums, where the patient can make complaints and suggestions for a better service. The group is often able to meet patients' needs of which they were previously unaware. These meetings also provide opportunity for health education. It might be suspected that such meetings would rapidly degenerate into a sort of "doctor who tells" session, but patients quickly take an active and practical interest in the common-sense problems of medical care and make a real contribution to the smooth functioning of the group.

The response of patients to this type of practice is something like that of a community to the local hospital. They come to take the same kind of pride in their medical centre as they do in their hospital, and with encouragement will take the same effective sort of community action to support and promote it. Such local action is to be encouraged, not discouraged, even within a service like the N.H.S.

What happens if most of the patients want to join the list of the most senior or most popular doctor? How does a junior member get established without actually directing patients to him? The appointment system is a great equaliser. Most people remain loyal to any doctor, however haphazardly chosen, who treats them reasonably from the outset. When one doctor's appointments for the day (or list) is full, patients can be offered the choice of other members of the group. In any reasonably balanced group the work load is soon equalised. Here a mature, intelligent receptionist can do a great deal to give the patient confidence in all the group doctors. This equalisation of the work load has more compensations than drawbacks. The worst drawback perhaps is the ego-shattering effect on a senior man of watching a junior overtake him in number of patients.

This brings up the question of personality problems among doctors working so closely together. It is often claimed that doctors are such strong individualists that close coöperation is impossible. There are so many examples of good and continuing medical team-work

that this is obvious nonsense; but some general practitioners still claim that they are different from other doctors who work together in harmony. There is, of course, no denying that personality problems are important, and it is for this reason that I have laid so much stress on the need for leadership within the group and for a sound constitution by which disagreements can be arbitrated and resolved by democratic methods. Once the work load is reasonably evenly distributed, equal financial shares are one of the most practical means of avoiding controversy which so often turns on money. There is, however, plenty of latitude for the more traditional type of financial partnership agreements.

There should be no attempt at the outset to integrate these groups with the local-authority preventive services. Later many of the so-called personal health services will probably revert where they rightfully belong—to general practice. This is especially true of the maternal and child-health and school medical services. These mass services have merely been covering, on a semi-institutional basis, areas of neglect of single-handed general practice. These areas of neglect were never planned; they arose because the general practitioner had too much work to do and too little time to do it and was forced to give priority to acute medical problems calling for immediate treatment.

Wherever these basic groups work, a new equilibrium is established between the local-authority services and the work of the general practitioners. This must be given time to find its own level, but it will lead to the elimination and not the further development of mass, personal, public-health services. The original concept of a health centre founders on the false assumption that it is a good thing to bring together established local-authority services with present-day general practice. It is natural that most general practitioners have resisted the possibility of being swallowed by the local authorities. But if they are to oppose such theoretically plausible moves they must have sound counter-measures to put up. It is ridiculous to suggest that general practice, as at present organised, can effectively do the job of the mass, personal, and preventive services of the local authorities. Through the basic group practices this can be done.

What should be the relation of these groups to the local hospitals? Every doctor should have an active hospital association *provided* that he has the time to meet his hospital obligations and has a positive contribution to make to the hospital work. The idea that every doctor should be cluttering up hospitals merely in the pious hope that some sound knowledge and technique may "rub off" on him is pointless. There must be give and take, and this calls for time and a high level of performance in general practice. Basic group practice provides the opportunity for both of these, and where it is established the members of the group are almost always welcomed into the hospitals. Wherever and whenever specialists are convinced of the efficiency of general practice the whole relationship of general practitioner with specialist changes dramatically. Much the same holds for the relationship of general practice with the medical schools and research-workers. General practice has an enormous contribution to make to both social and clinical medical research, but in its present state this great potential remains latent.

The impetus to group practice must come from the doctors themselves. It cannot be successfully thrust on them from above, and no amount of elaborate defining and theoretical planning can take the place of practical experiment. Provided that the needs of the patient and the fine traditions of general practice are safeguarded, doctors and patients have nothing to fear and everything to gain from a sound and simple reorganisation of a service which is today vastly disorganised.

Special Articles

ARMED FORCES' MEDICAL SERVICES

Statement from the Ministry of Defence

THE Ministry of Defence announce this week that the Government have decided to set up a small independent committee of not more than 5 members to examine the present position of the medical and dental services for the Armed Forces. Its terms of reference will be:

"To review the arrangements for providing medical and dental services for the Armed Forces at home and abroad in peace and war; and to make recommendations."

Viscount Waverley has agreed to act as chairman, and the names of the other members will be announced presently.

Recruiting for permanent regular commissions in the medical branches of the Services is at present disappointing, and the number of applications for these commissions has declined steadily in recent years. Considerable numbers of newly qualified doctors are available as National Service officers, but there is a serious shortage of specialists, particularly in the Army and the Royal Air Force.

IMMEDIATE CHANGES

The committee's inquiry will take some time, and the Government have therefore decided to take certain immediate steps which, it is hoped, will encourage more doctors to make a career in the Services. On Oct. 1 increases in pay are to be introduced, and certain administrative changes will be made which will affect conditions in the medical branches and which have been designed to widen their appeal to potential recruits.

Improved Rates of Pay.—These are to be granted to medical officers in the middle ranks—i.e., major to brigadier (and the equivalents in the other Services). The increases range from about £90 a year for a major on first appointment to about £240 a year for a brigadier. The new *basic* rates (not including lodging, ration, or marriage allowances) will be:

* Rank (Only Army ranks shown)	Medical officers New annual rate	Medical officers Existing annual rate	Dental officers New annual rate	Dental officers Existing annual rate
	£	£	£	£
Major	1004	913	940	858
After 2 years	1113	967	1049	913
„ 4 „	1223	1022	1159	967
„ 6 „	1278	1077	1214	1022
Lieutenant-colonel	1332	1205	1268	1150
After 2 years	1442	1259	1378	1205
„ 4 „	1551	1314	1487	1259
„ 6 „	1606	1369	1542	1314
„ 8 „	1606	1424	1542	1369
Colonel	1734	1551	1670	1497
After 2 years	1789	1606	1725	1551
„ 4 „	1843	1661	1779	1606
„ 6 „	1898	1716	1834	1661
Brigadier	2008	1770	1944	1716

The specialist pay given to senior specialists in the Royal Navy and Army will be increased to about £220 a year: specialists in the Royal Air Force will receive corresponding advantages by accelerated promotion. In addition to these improvements in pay it has been decided, as a temporary measure, to introduce a permanent-commission grant of £1500 (taxable): this will be paid in future to officers granted permanent commissions, payment being subject to the completion of one year's satisfactory service as a medical officer on any type of commission.

Administrative Changes.—The new provisions will include the following:

(*a*) There will be a considerable number of posts for retired officers of the medical branches whose services can be effectively used in less active jobs, so as to release younger men for the more active ones.

(*b*) All doctors seeking a permanent career in the Royal Army Medical Corps will be given the opportunity of taking a regular commission on entry, instead of, as

hitherto, being required first to take a short-service commission.

(*c*) Late entrants to the medical branches of all three Services, whether on permanent or short-service commissions, will have their seniority as officers antedated, according to their civil experience, up to a maximum of 7 years.

(*d*) The scheme already in operation in the Royal Air Force, for the grant of three-year short-service commissions to doctors liable for National Service, will be extended to the Army.

Dental Branches.—Closely comparable arrangements are being adopted in the dental branches. The increases in pay will range from about £80 a year for a major on promotion to about £230 a year for a brigadier. In addition, it has been decided, as a temporary measure, to introduce a permanent-commission grant of £1250 (taxable); this will be paid in future to officers granted permanent commissions, payment being subject to the completion of one year's satisfactory service as a dental officer on any type of commission.

Occasional Survey

WORLD-WIDE Q FEVER

A REVIEW of the epidemiology of Q fever [1] and a survey of its world distribution [2] illustrate strikingly the change in our concept of this disease in the fifteen years since it was discovered.[3] In the mid-40s it seemed merely an item for the collector of rarities; now, in the 50s it is recognised in sixteen countries of the world, including Great Britain.[4]

In 1950 *The Lancet* [5] considered some of the circumstances of the discovery of Q(uery) fever, the identification of the causative organism as a rickettsia, and the beginnings of its epidemiological investigation outside Australia. Now it is possible to chronicle further this remarkable success story of a parasite and to speculate about its rise from lowly origins to a worldwide endemic disease.

The reasons for its success? Chiefly, it would seem, the ability to combine the obligate intracellular mode of existence with broad tissue trophisms—it can grow equally well in the intestine of a tick, the reproductive tract of a cow, or the respiratory tract of a man—and great resistance to heat, drying, and sunlight when passing between hosts. These are talents unmatched by any other rickettsia or virus, and perhaps only approached by organisms of the brucella group with which it has many epidemiological affinities.

The list of hosts, or places, in nature from which the rickettsia has been isolated is a long one. Derrick [1] and Berge and Lennette [2] mention some seventeen ixodid and two argasid ticks (allowing for synonyms) and two small wild animals—the Australian bandicoot and the Moroccan gerbille—as well as cattle, sheep, and goats in various parts of the world. Recently, the known host range of the organism has been extended by observations of natural infection in pigeons and geese [6] and the human body-louse.[7]

The presence of *Rickettsia burneti* in so many situations can doubtless be explained in various ways. By an evolutionary explanation, which is perhaps the most attractive, such diversity is the outcome of successive adaptation of the organism from the original state as a parasite of ticks to one of larger animals and man, with ultimate independence of arthropod transmission from host to host. This adaptation might be supposed to have occurred separately in different parts of the world and to have reached different levels according to the number and aggregation of local animal species, local agricultural practice, and climate. No doubt the pattern of development would also be complicated by movement of infected domestic animals within, and also between, countries.

EVOLUTION

The universal and primeval situation may be supposed to be the infection of the tick and its small wild animal hosts. Two possible examples of this may be cited: that of the bandicoot and its tick (*Hæmaphysalis humerosa*) in Queensland,[8] and the merion (gerbille) and its tick (*Hyalomma excavatum lusitanicum*) in Morocco.[9] If this supposition were correct it would be necessary to show that these "basic" reservoirs exist in the wild where there is little probability of cross-infection from domestic animals.

Bandicoots (*Isodon torosus*) were found by Derrick [8] to be infected in various parts of Queensland; but the situation on Moreton Island, off the Queensland coast, is of particular interest. The mammalian fauna of this isolated place was limited, consisting mainly of bandicoots and rats.[10] The bandicoots were heavily infested with *H. humerosa*, and *R. burneti* was isolated both from them and from the bandicoots, which commonly also showed serological evidence of infection. Experimental Q fever in the bandicoot [11] was an inapparent infection with a rickettsæmia sometimes lasting seven days. Survival of *R. burneti* was demonstrated through each instar of *H. humerosa*, and suggestive evidence of transovarian passage was also obtained.[12]

These findings—inapparent host infection with a relatively long rickettsæmia and transovarian transmission of the organism in the tick—might be expected if the organism is to survive in circumstances where potential hosts are relatively few and solitary in habit. As only a small proportion of *H. humerosa* were found to be infected in nature and transovarian passage proved inconstant, *R. burneti* cannot be regarded merely as a universal commensal of the tick. It seems more probable that tick and bandicoot participate in a cycle of infection.

It might also be expected that tick small-animal reservoirs would be found in other continents where Q fever has been detected in man or domestic animals. Apart from the possible example in Morocco, the early American work on Q fever revealed that *Dermacentor andersoni*,[13] *D. occidentalis*,[14] *Hæmaphysalis leporis-palustris*,[15] and *Ixodes dentatus* [15] were infected in nature, and it would be interesting to know whether the small-animal hosts of these ticks are involved in a cycle of infection. It is also possible, in view of the infection of argasid ticks and birds, that similar cycles may exist among them.

INFECTION OF LARGE ANIMALS

The next stage in the evolution of Q fever was perhaps the adaptation of the organism to larger animals as a consequence of domestication and herd formation in areas where the tick small-animal cycle was present. The organism could at first have been transmitted among them by infected ticks, and later, with further adaptation and in circumstances of more intense animal husbandry, have been transferred by means other than an arthropod vector.

1. Derrick, E. H. *Med. J. Aust.* 1953, i, 245.
2. Berge, T. O., Lennette, E. H. *Amer. J. Hyg.* 1953, **57**, 125.
3. Derrick, E. H. *Med. J. Aust.* 1937, ii, 281.
4. See Marmion, B. P., Stoker, M. G. P., McCoy, J. H., Malloch, R. A., Moore, B. *Lancet*, 1953, i, 503.
5. *Ibid*, 1950, i, 960.
6. Babudieri, B., Moscovici, C. *Nature, Lond.* 1952, **169**, 195.
7. Giroud, P., Jadin, J. *Bull. Soc. Pat. exot.* 1950, **43**, 674.
8. Derrick, E. H., Smith, D. J. W. *Aust. J. exp. Biol. med. Sci.* 1940, **18**, 99.
9. Blanc, G., Bruneau, J., Martin, L., Maurice, A. *C.R. Acad. Sci., Paris*, 1948, **226**, 607.
10. Annual Report on the Health and Medical Services for the State of Queensland, 1938–39; p. 54.
11. Derrick, E. H., Smith, D. J. W., Brown, H. E., Freeman, M. *Med. J. Aust.* 1939, i, 150.
12. Smith, D. J. W. *Aust. J. exp. Biol. med. Sci.* 1940, **18**, 103.
13. Davis, G. E., Cox, H. R. *Publ. Hlth. Rep., Wash.* 1938, **53**, 2259.
14. Cox, H. R. *Amer. J. trop. Med.* 1940, **20**, 463.
15. Parker, R. R., Bell, E. J., Stoenner, H. G. *J. Amer. vet. med. Ass.* 1949, **114**, 55.

Derrick [16] originally suggested a transfer from bandicoots to Australian cattle by ticks such as *Ixodes holocyclus*, which have a wider host range than *H. humerosa*. Evidence of this transfer, or of spread of infection by the common Australian cattle-tick (*Boophilus microplus*) was, however, not obtained. Nevertheless, *R. burneti* has been isolated elsewhere from suitable ticks which have a wide host-range and infest domestic animals. Examples are *Amblyoma americanum* (hosts: cow, goat, and dog) in the U.S.A.[17]; *Hyalomma savigni* (calf and sheep) in Spain [18]; *Hæmaphysalis leachi* (cattle and dog) in the Congo [19]; and *Hyalomma mauretanicum* (bovines) in Algeria.[20] Further work is needed to find out whether these tick-host systems represent a transitional stage in which spread of infection in the herd is mainly due to ticks, or whether the situation is similar to that found in Californian cattle and sheep, where infection apparently spreads without arthropod assistance.

Most of our precise information about the spread of Q fever among domestic animals is derived from American investigations of cattle and sheep. In the Los Angeles area Q fever was found to be particularly common in the dairy herds, some 15% of 120,000 cattle having serological evidence of infection. Of new entrants to these (mainly) tick-free herds 40% became infected within six months of their arrival.[21] An entirely novel aspect of the disease was uncovered by the discovery of the rickettsia in the milk [22] of the cattle and in large numbers in the placenta.[23] The significance of these epidemiological observations was extended by experimental inoculation of cattle. These could be infected by intradermal inoculation, but efforts to transmit infection with the spinose ear-tick (*Otobius megnini*), which is sometimes found on Californian cattle, were unsuccessful.[24] Infection also resulted from inoculation of the udder via the teat canal.[25] The dose of organisms required to do this was unnaturally large, however, and the possibility of spread of infection by milking was subsequently excluded by the failure to infect cows on repeatedly dipping their teats in infected milk.[24] In further experiments a pregnant cow was infected by the inhalation of an aerosol of *R. burneti*; and although the organism was not isolated from the blood-stream or milk, it was found in the placenta at parturition.[24]

Examination of infected sheep in North California revealed that *R. burneti* was present in the placenta,[26] milk,[27] fæces,[27] and nasal secretions [27] at lambing and could also be isolated from nearby dust and air.[27] Animals could be artificially infected by intratracheal inoculation; and after a clinically and bacteriologically dormant period the organism was excreted at parturition.[28]

It is evident, therefore, that the susceptibility of cattle and sheep to infection by the respiratory tract, and the heavy contamination of the environment by infected and parturient animals, provides a means of airborne dissemination of infection in the herd which is quite independent of any spread by arthropods. The possibility of infection of the young *in utero* or by suckling an infected dam remains to be assessed; but this would not explain, for example, infection of adult entrants to a herd.

INFECTION OF MAN

It is at the level of the adaptation of the rickettsia to the domestic animal that man becomes involved. The tick/small-animal complex is apparently not a potent source of infection for man, although a few examples have been reported. Infection of man appears to be due mainly to the inhalation of dust or droplets containing the rickettsiæ, although it is also probable that some infections follow the drinking of infected raw milk. The risk to persons whose occupations take them into places where the dust or air is contaminated by animals, as described, is obvious enough. Connections with the source of infection may be more obscure [29] when the contaminated dust is carried by the wind, or on fomites to be inhaled by the victim in surroundings as innocent of animal content as business offices, laundries,[30] gambling or hairdressing saloons, bars, or the lodgings of laboratory workers.[31]

Because of the possibility of multicentric origins and adaptation of *R. burneti* to various hosts, it is important to know whether strains of the organism from human, animal, and arthropod hosts differ in their antigenic structure, pathogenicity, or morphology. Berge and Lennette [32] describe an analysis of the complement-fixing antigens of strains from man, sheep, cattle, and ticks. Taken at face value, the results suggest a broad family relationship, rather than a complete identity of antigens—findings which would support the general concept. Sharp differences were observed, for example, between some sheep strains and the classical Nine Mile—Henzerling types. It is clear, however, that the antigenic classification of strains of *R. burneti* is likely to be a matter of considerable technical difficulty. The work of Stoker [33 34] and Herzberg and Urbach [35] indicates that the complement-fixing pattern of some freshly isolated strains changes distinctly with serial passage in the yolk-sac of the chick embryo. Human and guineapig sera differ considerably in their breadth of complement-fixing ability according to the length of time after infection at which they are taken. It will be necessary to define more exactly the conditions under which antigenic variation takes place; and if much weight is to be given to the results strains passaged to a comparable extent should be used and sera obtained after standard courses of immunisation.

THE FUTURE

What of the future—do further adaptive adventures remain for *R. burneti*? Infection of man would seem to be an unsuccessful venture for the parasite, since man-to-man passage is uncommon. This may be due largely to the absence of highly infective excretion in the majority of patients. Transmission becomes possible when an excretion is infected, as was the copious sputum of the laboratory assistant in Frankfurt who infected 38 contacts.[36]

With an organism of the versatility of *R. burneti* fresh developments may be expected. Indeed, the recent account by Jadin and Giroud [37] of an outbreak of 450 cases of Q fever with 40 deaths in the Belgian Congo and of the isolation [18] of *R. burneti* from the human body-louse taken from persons in the area, may be a striking, if unwelcome, manifestation of such versatility.

B. P. MARMION.

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In England Now

A Running Commentary by Peripatetic Correspondents

VIENNA has started experimenting with zebra crossings. The Viennese, with their usual acid wit, are saying that if they do not hurry there will be nobody left alive to use them. Popular hyperbole apart, the official attitude to motorists and pedestrians comes out well in the public announcements: "It is hoped at these crossings motorists will exercise the greatest care." There is no mention of stopping or pedestrians having the right of way. No doubt the municipality knows its motorists.

The pedestrian's rights are confined strictly to the pavement. I have not seen a motorist actually mount the kerb in pursuit of a pedestrian. There are street-crossings in the busier parts of the city where the policeman on duty will beckon you to cross, but you get the feeling that your right to be on the roadway even there is relative, though the policeman would be very angry indeed if a motorist killed you on his crossing.

Apart from these two places the rights of the motorist are absolute and undisputed. The volume of traffic would send a London policeman to sleep from boredom, but the pedestrian straying on the road who imitated him for the merest fraction of a second would stand small chance of waking again in this world. There is a speed-limit of 40 kilometres an hour, but I never noticed anyone (and that includes the police) paying any attention to it. Speeds of 40–60 miles an hour along the wide streets draw no comment. Perhaps this is due to that alert brain and nimble body so characteristic of the Viennese. Natural Selection, with the petrol engine as its instrument, must have long ago eliminated those of torpid mind and sluggish limb.

I never saw a car slow down for a pedestrian, nor met anyone who expected it to. I have even endured the experience—my nervous system is permanently impaired—of a motor tour at speed with one of the most optimistic and sanguine of the inhabitants. There was a horrible lurch, the familiar scream of brakes, and a child escaped slaughter by inches. My driver was furious. "He might have capsized my auto," he roared to the terrified mother, and nobody, not even the mother, seemed to find his complaint incongruous.

* * *

For years I have been meaning to clear out the cupboard where medical samples have been put, ready for some abstruse emergency if my ordinary day-to-day pharmacopœia failed.

Yesterday I tackled the job. With carefree zest I discarded pills, tablets, capsules, powders, pots of cream, bottles of lotion. But what to do with them was another matter. Obviously I couldn't risk dumping them in the domestic dustbin and sending them on their murderous way to the municipal refuse-heap. So into one pail, borrowed from the kitchen, I emptied all the solids; and into another—frightened to death lest there should be an explosion—I poured the liquids in all their various degrees of fluidity. The final dark-brown, oily, aromatic mess I poured down a grating in the yard. But the solids were more difficult. With memories of ampoules which went off with a bang when put on the fire, I finally decided to bury my old acquaintances in a common grave—poor little corpses in red, green, pink, white, and brown. I dug the grave myself, not wishing to trust anyone else with so delicate a mission, but now that the grim ceremony is over I shiver to think of the ultimate fate of the worms, centipedes, and creeping crawling things which I disturbed and which I shovelled back on top of the vitamins, rejuvenators, tonics, poisons, and such-like. A violent death will probably overtake most of them, but I shouldn't be at all surprised if, some night returning from a convivial evening, I met a caterpillar the size of a well-filled sausage.

* * *

A statistical colleague of ours—a fastidious man—recently complained about the dust which persistently collected in his room. By a series of experiments involving the analysis of variance and the closing of different windows and doors he had been able to exclude both the corridor and the road outside as possible sources. His room was regularly cleaned, and he had had it hermetically sealed, but still the dust advanced, grey, cosmic, menacing. He wished, he said, he had some means of determining the nature of the deposit; it might, he hinted, be extraplanetary in origin, or due to the activities of a mathematically inclined poltergeist.

An appeal of this nature could not be ignored, and within ten minutes a battery of microscopes had been set up, and the mantles of Sherlock Holmes and Dr. Thorndyke had descended upon us. With watch glasses and camel-hair brushes we crawled under the tables, labelling each specimen carefully with the precise source and date. With glad cries we attracted each other's attention: "Quick, Watson, the Coley's fluid!" "What do you make of this rotifer, Jarvis?" "Undoubtedly the hair of a camel, my dear Watson." "Extraordinary, my dear Holmes!" "But very elementary."

We investigated the turn-ups of our colleague's trousers and the contents of the breast-pocket of his lab-coat; we spent a happy hour devising miniature dust-extractors. The bubble burst when tea arrived and we leant back exhausted, our gaze seeking inspiration in the ceiling. Even as we watched, a crack appeared and a little trickle of extraplanetary dust floated down to settle on our colleague's adding-machine.

* * *

Among all the new faculties and bodies now airborne should not a College, preferably Royal, of Medical Scribes have a high priority? Candidates, unless of unusual brilliance, would have to start their Greek at 12 or younger, so there is no time to be lost. At school they would study Greek, Latin, and English, with the appropriate sciences as subsidiary subjects, and perhaps the history of medicine. A shortened version of the medical curriculum will follow, and during the whole of this pupillary period they will have daily practice in their life's main task—turning bad English into good. They should be ready to take their diploma about the age of 24.

If the paper shortage continues, it will probably become obligatory for medical writers to submit to the college all matter intended for textbooks and all technical papers for publication in the journals. The college will also enjoy a monopoly in the coining of new words for the medicopathological vocabulary. Members of the college will appear on State occasions in academic dress and will stand high in professional esteem. Publishers, editors, and grateful readers should subscribe generously to the college funds; so should the Exchequer in recognition of the tons of paper and ink it will save. Let its fame once cross the Atlantic and it must surely become a conspicuous dollar-earner. They need it even more over there.

* * *

She lives nearby and is very deaf and we had got her a hearing-aid from the National Health Service. Tragedy befell when the aid packed up the day her sister returned from Canada, overflowing with news after thirty-five years, and only a few days before her son's wedding. The aid must be put right without delay, and who more likely to mend it than the kind doctor who prescribed it? He ought to have a complete mastery of the instrument he had recommended and, come to think of it, a moral duty to fix it.

Thus she arrived one evening after supper. In one of those unaccountable moments I decided to investigate and unscrewed four bolts holding the back of the instrument in place. I cast my baffled eyes on a maze of criss-crossing wires and saw no obvious lesion anywhere. But I went hot under the collar as I read a notice in block pencilled letters on a paper neatly affixed inside the back: THIS HEARING-AID IS GOVERNMENT PROPERTY. YOU ARE NOT TO TOUCH IT. REPLACE THE BACK AT ONCE. I showed my patient this admonishment. "Oh my dear life" she said, and we complied at once.

* * *

A Polish gentleman arrived at our hospital yesterday to make an appointment for a barium-meal examination. Since he was unable to speak any English he brought with him a fellow countryman as interpreter. Sister, through the medium of the latter, gave him full instructions and told him to attend today at 9.30 A.M., having had no breakfast. He duly arrived, complete with the interpreter, but he had enjoyed his bacon and eggs; the interpreter it was who had starved.

Letters to the Editor

"BACK TO FRONT?"

SIR,—Dr. Dornhorst is manifestly trailing his coat in his article in your educational number of Sept. 5, and it would be a pity to disappoint him. Because medicine was cradled in quackery and mere empiricism, and has only slowly and painfully won through to some sort of scientific basis, he would have our students recapitulate that grim history, starting with empiricism and working backwards into science; he would have them parachuted into the jungle, to flail about in it for a year or two before being given even a glance or two at the maps. There is surely no real risk of the extreme turtle-turn he envisages in medical education ever taking place, but perhaps it is worth marshalling a few of the arguments.

History is all against Dr. Dornhorst. Basically, he repeats the old arguments for the apothecaries and the barbers, who learnt by apprenticeship, as against the physicians and (later) the surgeons, who began by acquiring some theoretical knowledge. Those arguments were tenable up to about 1800, but by that time the basic sciences had reached the stage (Morgagni was the real turning-point) of being of real use to the practising physician. The legislation and the literature alike of the ensuing century leave no doubt that those who saw the products of the apprenticeship system and the academic system side by side were quite sure which produced the better doctor. And what, fundamentally speaking, has changed since then?

No matter how the course is reconstructed the student will always have more to learn than he conveniently can in the time. How is he likely to learn most: if his observations are presented to him as a nexus of empirical facts, organised only in so far as certain sequences of events are commoner than others and can therefore be exalted into nosographical entities, or if they are presented to him as being at least in part the logical consequences of what he has already learnt about the normal body and its behaviour under stress? This question might even be susceptible of experiment. Let Dr. Dornhorst take a group of third-year students and teach them for a term about, say, tuberculosis: let him start with patients and let him diverge into the basic sciences only in so far as the study of his patients leads him. And let at the same time an equally competent and enthusiastic teacher take a second comparable group, and teach them for half a term in the laboratory about the tubercle bacillus, the pathology and immunology of tuberculosis, and the pharmacology of the relevant drugs, and then take them into the wards for the remaining half-term. If at the end of the term the first group remember more even of the strictly clinical aspects of tuberculosis than the second, then Dr. Dornhorst will have a case: and I will eat my hat.

The most precious asset of a medical school is not its lecture-theatres and its laboratories but its hospital beds. The present system does at least ensure that the student arrives at the bedside with a prepared mind, determined to waste no minute of his time there. Dr. Dornhorst's students in the wards would be twice as numerous and only half as keen.

His specialty is at the moment the most exciting in medicine. The efflorescence of physiological methods of diagnosis and pharmacological methods of treatment in the last decade or two has made it natural, even justifiable, for physicians now to believe that they have more to give their students than anyone else. The best physicians nowadays are those who most successfully contrive to treat the rest of their school as one vast clinical side-room to the medical wards—and I use the word "best" in no pejorative sense. But the extension of that most valuable attitude to the whole medical course argues a want of proportion. We morbid anatomists used to regard our hospitals as mere adjuncts and receiving wards for our post-mortem rooms. We have learnt wisdom: and that is perhaps why so many good deans have started life as pathologists.

Dr. Dornhorst's system could have some wonderful results in other trades. Botanists would have to begin life as farmers and geologists as miners. The last subject to be taught to an accountant would be arithmetic, the last to be taught to an author writing, and the last to a Reader—reading!

Postgraduate Medical School of London, London, W.12. BERNARD LENNOX.

SIR,—I have read with great interest Dr. Dornhorst's article on a possible reorientation of the medical curriculum.

Speaking both for myself and a great many other doctors, I would most strongly support his suggestion that the French system, under which the student begins straightway on the clinical subjects, should be widely adopted. Under our present system in this country the student scarcely comes in contact with a patient until he has been receiving so-called medical education for at least two years. He is given a great deal of instruction in what one may call the background of medicine without having any realisation of its relation to the problems with which he will ultimately have to deal.

It is universally recognised that in order to secure the learner's interest and coöperation it is essential that the information given should be in response to the demand coming from the student himself. Our present method of medical education is the exact opposite of this, so that students feel that they are being crammed with an enormous amount of factual material for which they can see no possible use. By the time a student has completed the 2nd M.B. he is frequently nauseated with all this mental pabulum for which no "appetite sauce" has been created. In consequence he tends to reject it, that is to say forget it, as soon as he has passed his examination. By the time that he has completed his clinical studies he is beginning to ask the questions to which his earlier studies could help to supply the answers. He therefore has to revise, from quite a new approach, all that he learned and forgot in the first two years. This procedure is obviously extremely wasteful of time and energy both for the student and the teacher.

Dr. Dornhorst's suggestions would in my opinion be a far sounder way of teaching medicine and enlisting the interest and understanding of the student from the very beginning of his course. I hope that this most valuable suggestion will have due consideration in the investigations that will be carried out as a result of the first World Conference on Medical Education.

London, W.9. DORIS M. ODLUM.

THE RETICULOSES

SIR,—Some years ago a Cambridge journal[1] which is too little known published an anonymous poem which seems apposite to some of the points in Dr. Israëls's[2] interesting lecture on the reticuloses:

> The species of blackberry
> Are very apt to cross
> Leaving the systematists
> Completely at a loss,
> And distinction of varieties
> Is really quite imposs.!

Dr. Israëls says that what contributed most to the abandonment of the classification which I put forward some fifteen years ago[3] is "that practical experience has shown how difficult it is to fit the changes seen in

1. *Tea Phytologist*, 1939, x + 1, no. 1, p. 13.
2. *Lancet*, Sept. 12, 1953, p. 525.
3. *J. Path. Bact.* 1938, 47, 457.

lymph-glands into so rigid a series of subdivisions." Yet his classification enumerates eight out of the fifteen categories of the 1938 classification; and of the seven which he omits three are perfectly familiar to every histologist—reactive hyperplasia, sinus catarrh, and sarcoidosis—and the other four were stated in 1938 to be doubtful entities or only to occur under experimental conditions. He also says: "another reason for the eclipse of a classification based on morbid anatomy is the frequent failure to give a precise lead on prognosis and the best form of treatment." Although it is unreasonable to expect any classification to provide this very necessary information, yet that which he himself propounds categorises the entities by their histological characters and does not appear to provide any lead on prognosis or therapy. It does, however, introduce a new nomenclature into this field of medicine which has been bedevilled for the last sixty years with a plurality of terms.

My 1938 classification of lympho-reticular disorders, which, as Bodley Scott [4] observed, "avoids what the late Professor Whitehead called 'the fallacy of over simplification'" was a heuristic experiment in histological methodology; the subsequent experience of over 2000 cases, of which the majority have been under follow-up either to the present day or until death, suggests to me, at any rate, that it was a successful experiment. In many cases it is now possible to prognosticate the course of the disease on the basis of the biopsy findings, and, contrariwise, one can often foretell the probable histological changes by a study of the clinical manifestations. Naturally the experimental classification of 1938 did not prove to be perfect in practice. It can be simplified, either because histological entities mentioned in it have proved to recur so infrequently that it is doubtful if they can be regarded as clinical entities, or because it has been found that certain of the histological subdivisions are not related to clearly defined disease processes, and so, even though their histological distinction is perfectly possible, it has, at any rate at the present time, no practical value; lastly in one or two instances, clinicopathological entities of importance have been recognised which were not set out clearly in the original classification. A brief summary of the results of the first six years' survey was published [5] some time ago, together with an attempt to set out analytical principles by which the histological diagnoses could be achieved; detailed accounts of the natural history of the twelve main disease-groups, apart from the reactive, inflammatory, and storage disorders, are in course of preparation by my colleagues and myself.

I think, apart from its apparent complexity, that the feature of my 1938 classification which most dismayed people was the nomenclature adopted; these lengthy descriptive terms, like the labelling of German wines, were designed to give a précis of the salient features of each category but were far from euphonious. However, the problem was and still is what one should do: of specific ætiology we know nothing; apart from Hodgkin's disease, there were few eponyms available as many of the clinical entities were not then recognised; nor have we the chemist's advantage of a standardised symbolic shorthand. It is clear that the terms which I used originally could be shortened, and this I have endeavoured to do in subsequent writings; but whatever nomenclature is adopted, if it is to be meaningful, must be defined so precisely that it can be used by others, and that is the chief defect, as I see it, of Dr. Israëls's classification. From his accounts, I would have little idea what microscopical appearances I should expect to see in a biopsy so that I could inform him that it was a case of "giant-cell reticulosis," nor what clinical features would lead me to suspect that a patient was suffering from "the myeloid form of reticulum-cell reticulosis."

I fully realise that in a presidential address covering a broad field it is virtually impossible to enter into descriptive minutiæ, but in matters of classification and nomenclature, which we too often forget are very different things, we should remember the principles that Sydenham [6] set out for writing the history of a disease:

"What short way—what way at all—is there towards either the detection of the morbific cause that we must fight against, or towards the indications of treatment which we must discover, except the sure and distinct perception of peculiar symptoms? Upon each of these points the slightest and most unimportant circumstances have their proper bearings. Something in the way of variety we may refer to the particular temperament of individuals; something also to the difference of treatment. Notwithstanding this, Nature, in the production of disease, is uniform and consistent; so much so, that for the same disease in different persons the symptoms are for the most part the same; and the selfsame phenomena that you would observe in the sickness of a Socrates you would observe in the sickness of a simpleton. Just so the universal characters of a plant are extended to every individual of the species; and whoever (I speak in the way of illustration) should accurately describe the colour, the taste, the smell, the figure, &c., of one single violet, would find that his description held good, there or thereabouts, for all the violets of that particular species upon the face of the earth."

Radcliffe Infirmary, Oxford. A. H. T. ROBB-SMITH.

CORTISONE AND CORTICOTROPHIN IN BLOOD DISEASES

SIR,—The comments and conclusions of your editorial (Aug. 8), in regard to the hormonal treatment of idiopathic thrombocytopenic purpura and Schönlein-Henoch purpura, are of great interest.

As is well pointed out, evaluation of therapeutic measures may be difficult indeed in diseases with a variable natural history and tendency to spontaneous remissions, and no proof is yet available that cortisone and corticotrophin in any way modify the fundamental pathogenetic mechanism of idiopathic thrombocytopenic purpura. I feel, however, that hormonal treatment of the disease should not be entirely disregarded or considered of only limited value. After Robson and Duthie [7] it is generally admitted that cortisone and, particularly, corticotrophin will, at high doses, increase "aspecifically" (or, better, "unexplainably") the resistance of the capillary wall when this is reduced (as in idiopathic thrombocytopenic purpura). Furthermore, the clotting-time of whole blood may be accelerated. As a result of these and, possibly, other effects, the bleeding tendency of idiopathic thrombycytopenic purpura is reduced by the drugs. As you remark, we have found corticotrophin and cortisone therapy useful in: (*a*) control of bleeding in the acute cases of disease pending occurrence of spontaneous remission; (*b*) preparation for splenectomy of chronic cases of the disease; (*c*) control of severe bleeding in chronic cases which have failed to recover following splenectomy. Furthermore, corticotrophin and cortisone appear to potentiate the beneficial effect of platelet transfusion, and we have often obtained the impression that their use accelerated the occurrence of spontaneous remissions. The beneficial effect on bleeding of corticotrophin and cortisone extends to other thrombocytopenic states, such as those due to acute leukæmia. We have thus far obtained first remissions in 24 of 27 cases of acute lymphocytic leukæmia in children, and repeated remissions in some of these by the use of aminopterin along with corticotrophin or cortisone. We feel that these favourable results are due, at least in part, to the control

4. Scott, R. B. *Brit. J. Radiol.* 1951, **24**, 475.
5. Recent Advances in Clinical Pathology. London, 1947; chapter 34.
6. The Works of Thomas Sydenham. London, 1848; vol. 1, p. 15.
7. Robson, H. N., Duthie, J. J. R. *Brit. med. J.* 1950, ii, 971.

of bleeding by these hormones so that higher doses of aminopterin can be administered. While the initial platelet-count is further depressed by the myelosuppressive agent, corticotrophin and cortisone protect against hæmorrhage.

I also feel that your conclusions with regard to hormonal treatment of Schönlein-Henoch purpura should be commented on in view of 9 cases we have treated in the past 4 years. The response of the disease to corticotrophin and cortisone is admittedly variable. When favourable, however, the improvement of the subjective symptoms of arthralgia, abdominal pain, &c., and the reversal of the skin lesion (as studied by serial biopsies) are very often too prompt to be exclusively due to spontaneous recovery. At times all symptoms recur when treatment is discontinued. Curiously enough, corticotrophin, in our experience, is much more effective than cortisone in this disease.

The main purpose of this letter is not to disagree with, but rather to complement, the conclusions presented in your editorial. Corticotrophin and cortisone probably do not modify essentially the pathogenetic mechanisms of idiopathic thrombocytopenic purpura and might not modify that of Schönlein-Henoch purpura. Patients, however, often benefit greatly (even if aspecifically) from this form of therapy, as is indicated above. I feel, then, that it should not be denied to them when no contra-indications exist.

New England Medical Center and
Tufts College Medical School,
Boston, Mass., U.S.A. MARIO STEFANINI.

TOBACCO-SMOKING

SIR,—I thank Professor Adams for his charming tribute last week—the more appreciated because it was so unexpected. I congratulate him on his immediate complete cure from serious tobacco addiction, which cure must by now be well consolidated. I agree that there is no desirable substitute for smoking although some compensatory over-indulgence in sweets and other delicacies is, I think, permissible for a time, even at the risk of putting on weight. However, one has to learn to occupy one's time in the same way as do those who have never smoked.

I now think that smokers are emotionally inadequate—unable to bear with life's joys and sorrows without continually dulling these with the quick-acting and fairly powerful analgesic, nicotine.

Wallasey, Cheshire. LENNOX JOHNSTON.

MUNCHAUSEN'S SYNDROME

SIR,—In the correspondence which followed Dr. Richard Asher's interesting article [1] on this condition it was emphasised that these patients may develop a genuine organic lesion; the following case provides a good example.

A man, aged 42, was admitted to Leith Hospital late on the night of Saturday, Aug. 15, 1953. He said that he had arrived at Leith earlier in the day on a ship sailing from Ireland, and shortly after going ashore he had been seized by a severe crushing pain which passed across his chest and down the left arm. He was smelling of alcohol, and his pulse was irregular; and, as the history was typical of coronary thrombosis, he was admitted by the house-physician and treated with anticoagulants. I saw him in the morning, and his glib account raised suspicions which were increased by the appearance of his abdominal wall; it was a veritable battlefield with no less than nine scars, caused, he said, by sixteen operations undergone in various parts of London and America. Electrocardiography confirmed the presence of auricular fibrillation but showed no sign of infarction. In his pocket was found an insurance certificate dated four weeks previously in Edinburgh with a diagnosis of coronary thrombosis.

It was discovered that, a few hours before coming to Leith, he had discharged himself from the Royal Infirmary, Edinburgh, where he had been admitted in the previous week with a similar story and also under the influence of alcohol. Electrocardiography had shown no infarction and the rhythm was normal. It was later learnt that he had been in another ward in the Royal Infirmary in January of this year with a coronary thrombosis. The cardiograms taken at that time have been re-examined in the cardiology department and they show unequivocal evidence of an anterior myocardial infarction with auricular fibrillation.

The day after his admission to Leith Hospital the patient's cardiac rhythm became normal and further questioning produced truculent and evasive replies. A woman then appeared claiming domestic liaison with him and demanding his clothes which, she asserted, she had paid for. He was discharged at his own request after three days in hospital.

This is a genuine case of the Munchausen syndrome in a man who has had a myocardial infarction and now has a paroxysmal fibrillation. Should he present himself at another hospital—as he almost certainly will—with a similar story, it would require a bold casualty officer to refuse him admission.

Leith Hospital, Edinburgh. CHALMERS DAVIDSON
Assistant physician.

OCCUPATIONAL HEALTH SERVICE

SIR,—At the present time there is a tendency by some clinicians to classify the medical profession into administrative doctors and doctors undertaking treatment, with an inference that the former have had no clinical training and possess no clinical ability of any sort. This attitude was emphasised from the platform during the recent meeting of the occupational health section of the Royal Sanitary Institute at Hastings.

In considering occupational health—whether it is the minor group of special hazards or the much greater proportion of what may be called general health problems—there are two methods of approach. The one is the clinical approach to the individual, and the other is the communal approach to the occupational group: it makes no difference whether one is dealing with the narrow scope of industrial health, as applied to factories and places of work, or the wider implications of health applied to all occupations.

It does not appear to be recognised that there is a communal approach to occupational health. It is not possible for any individual general practitioner or an industrial medical officer to know whether the factors which may be influencing the health of the individual patient or of the workmen in the factory are particular to that individual or that place of work.

The doctor is to be commended for not merely accepting and dealing with a clinical problem, but for interesting himself in some preventive or remedial action. All the same, such practitioners are, perhaps, too near to the individual. What is needed, to supplement their valuable services, is some form of observation of the general health of occupations so that a disproportionate sickness-rate in some special occupation is at once made obvious and preventive action taken.

If in a town there are three factories all occupied in identical work under identical conditions and the sickness-rate of one factory is twice that of the other two, it is a fair comment to say that something unusual is happening in that factory. Who is to know this? Who is to make the comment? No individual practitioner and no industrial medical officer is in a position to have access to all places of work or all occupations, for all should be kept under simultaneous and continuous observation.

In this town there are four separate motor-bus undertakings. As far as I am aware, there is no coördination of sickness statistics to show whether all have the same rates; whether, for example, long-distance drivers vary from those employed on town routes, or whether certain schedules and timetables are associated with excessive sickness.

It is this aspect which is so often forgotten. What is more, it must be realised that occupational health problems are tied up with general health problems. Inefficiency at work may have nothing to do with the job itself but may be directly due to anxiety about home troubles, with resultant inability to concentrate on the job in hand. What effect has the thought of an ailing wife or sick child left in unsuitable accommodation, or an exasperated departure to work after a spoilt breakfast following a marital tiff with a fretful wife driven to distraction by constant noise in an inadequately sound-insulated flat? These are outside matters having a direct bearing on health in

1. *Lancet*, 1951, i, 339.

relation to the occupation. As isolated incidents, they have to be accepted in the rough and tumble of everyday life, but if a man is to lose his job because he is constantly inefficient they assume greater significance. Quoting from examples in my own records, the wife may have parkinsonism or the husband may be up half the night in attendance on an elderly relative with senile dementia. To remedy these as individual cases is one thing; to estimate the relative significance of them to occupational efficiency it is necessary to know of the whole picture of social problems in the community. Nothing is taken away from the individual clinician if it is suggested that his work in regard to a specific occupation is as firmly linked with the health department, as the local centre of sociomedical services, as should be his practice within any single home.

The community does not consist of healthy, stable, contented, well-housed individuals, but of families and individuals of various physical and mental calibre living under all sorts of conditions. Their health in their occupations cannot be separated from their general way of life. Until widespread communal studies of morbidity in relation to occupation can be made, no efficient occupational health service can be established. The present trend is for individual pressure groups to put forward their particular case without reference to the over-all needs of the nation or the economical use of sociomedical facilities, either at present available or expanded where necessary. A separate clinical service would merely duplicate the present general-practitioner and specialist facilities, while any creation of a separate preventive service with an epidemiological outlook would inevitably overlap with the work of the health department, which is already responsible for prevention and aftercare outside the place of work. The key to an improvement of occupational mental and physical health is an extension of the work of the present sociomedical team through wise coördination by those in a position to observe the community and draw on the facilities available.

W. S. PARKER
Brighton. Medical Officer of Health.

TREATMENT OF REGULAR MENORRHAGIA

SIR,—I have been very interested in the remarks on causation and treatment of idiopathic menorrhagia by Dr. Swyer (Aug. 15). I have had occasion recently to treat 7 patients with this condition, in which no obvious cause could be found.

Encouraged by earlier reports,[1–9] and because of success in a case of menorrhagia associated with infective hepatitis and a low plasma-prothrombin time, I have treated these 7 patients with vitamin K orally. The dose used was 10 mg. three times daily for seven days, starting on the first day of the menses, and continuing for three consecutive months.

This treatment was successful in all patients, and none so far have relapsed—the longest interval has been one year. In 4 of these cases the plasma-prothrombin time was prolonged, as measured by the Quick one-stage method; but subsequent efforts to confirm these findings were unsuccessful—all patients had had oral vitamin K in the interval.

A patient, aged 35, para 14, had had menorrhagia for several months. No local or general cause was found. On March 9, 1953, the plasma-prothrombin time was 29 seconds or 20% prothrombin; on May 7 (after treatment with vitamin K) it was 16 seconds or 67% prothrombin. The menstrual cycle prior to treatment was 8–10/28 days, with many clots. Since treatment the cycle has been 2–3/28 days, and there have been no clots. This patient is now completely cured.

In an effort to ascertain what step, if any, in the blood-clotting mechanism was involved, an investigation using controls has been undertaken. However, because of delay in finding suitable cases, some time must elapse before any conclusion can be reached. Meanwhile, because of the clinical success with vitamin K, we shall continue to use it empirically.

Galway, Eire. D. T. O'DRISCOLL.

1. Adams, W. *Therap. d. Gegenw.* 1942, **83**, 439.
2. Ballon, K. *Csl. Gynæk.* 1943, **2**, 13.
3. Baranowski, T. *Amer. Rev. Sov. Med.* 1945, iii, 173.
4. Dietz, R. *Münch. med. Wschr.* 1941, **88**, 1009.
5. Gubner, R., Ungerleider, H. E. *Industr. Med.* 1944, **13**, 301.
6. Libansky, J. *Čas. Lék. čes.* 1944, **26**, 782; *Ibid*, 1944, **37**, 811.
7. Olesen, M., Kaal, S. *Nord. Med.* 1944, **22**, 1022.
8. Rubsamen, W. *Arch. Gynæk.* 1942, **173**, 319.
9. Schafer, G. *Zbl. Gynæk.* 1947, **69**, 126.

WHAT IS ULCERATIVE COLITIS?

SIR,—Mr. Brooke [1] is right to draw attention to the uncertainty which surrounds the definition of ulcerative colitis.

Precision in this definition is, as I pointed out in a postgraduate lecture,[2] no mere academic nicety but closely related to pathology, treatment, and prognosis. Some of your readers who have been critical of Mr. Brooke's conclusions, though sympathetic with his aims, may be interested to hear of this paper which sets out along identical lines but reaches different conclusions. Whilst, as Dr. Naish (Aug. 1) indicates, the approach through ætiology is abortive and, as Mr. Brooke himself agrees, microscopy is unhelpful, a distinction based upon anatomical distribution is of little validity unless it can be related to other aspects such as prognosis or indications for treatment. It is on precisely these mutually related grounds that the definitions I favour rest.

Briefly, I suggest that for all practical purposes four separate entities may usefully be differentiated—namely, (i) Crohn's ileitis, with or without "skip" lesions in the colon; (ii) ulcerative colitis (or proctocolitis) which invariably involves the rectum and extends thence in continuity; (iii) segmental colitis, which involves neither ileum nor rectum and extends both in continuity and in skips; and (iv) proctitis (without colitis) which may be specific or idiopathic. This terminology is demonstrably related to gross pathology, symptomatology, choice of treatment, and prognosis; it invokes no new concepts but indicates the lines upon which a thoughtful analysis of non-malignant lesions of the colon may profitably be based.

I believe that if progress is to be made, a hypothetical and arbitrary distinction is needed between a number of closely related lesions. A really authoritative comment from, say, the St. Mark's Hospital group would, I am sure, be generally welcomed.

Department of Surgery,
University of Liverpool. CHARLES WELLS.

TRAUMATIC RUPTURE OF THE NORMAL SPLEEN IN CHILDREN

SIR,—In connection with Mr. Pender's interesting article in your last issue I would like to give a brief case-history illustrating two further points:

A girl of 7 years fell over in the school playground with several other children. She was later sent home with abdominal pain and visited at least three times by her doctor, who, being unable to make a firm diagnosis, rang up the hospital for advice, as a result of which she was admitted 24 hours after the fall. On examination there was no bruising, but the most notable features were the rapid, grunting respiration, with a distinct "catch" in it, and the accuracy with which she pointed out a small area low in the left posterior triangle of the neck as being extremely painful. On these grounds a diagnosis of ruptured spleen was made. Operation was through a midline incision for rapidity, since her condition was not good; but the spleen was so firmly bound to the posterior abdominal wall by congenital adhesions that a transverse extension cutting the left rectus had to be added.

The type of rapid, shallow, grunting respiration which this patient exhibited, with the "catch" denoting diaphragmatic irritation, has often helped me to make this diagnosis in adults when in doubt; on one occasion

1. Brooke, B. N. *Lancet*, 1953, i, 1220.
2. Wells, C. *Ann. R. Coll. Surg. Engl.* 1952, **11**, 105.

in a case of complicated multiple injuries involving also the chest and exhibiting this sign I was unwise enough not to do a laparotomy, and post-mortem examination showed the ruptured spleen to be a principal cause of death.

I believe that unusual fixation of the spleen by congenital folds of peritoneum contributed to its rupture in the girl's case by relatively minor violence, since otherwise it might have slipped out of the way.

Radcliffe Infirmary, Oxford. G. J. FRAENKEL Surgical tutor.

CIRCUMCISION

SIR,—As a general practitioner I am grateful for "Sir Daniel Whiddon's" advice (Aug. 15) on circumcision. It is strange how a really useful medical practice like vaccination tends to die out unless people are urged to have their children protected, while unnecessary operations like those for circumcision and tongue-tie remain popular.

Mr. J. D. Hennessy (Sept. 12) has raised another very important issue—namely, that forcible retraction or stretching of the foreskin can be harmful procedures. Some mothers are most upset if they cannot push the prepuce right back so as to clean underneath it. Others perform the operation on someone else's advice, but they dislike doing it. In my view this zeal for preputial hygiene is quite unnecessary or even harmful. More than once I have been called out to reduce an incipient paraphimosis, because the mother, having exposed the glans, is unable to replace the foreskin. After all, no-one ever thinks of inspecting the vulva of a small girl in order to remove the smegma. It is eight years since I returned to general practice from the Forces, and in that time I have never circumcised a small baby. I have seen only 3 cases of balanitis, and they all cleared up readily on sulphonamides and caused no further trouble. Quite apart from the danger of physical damage to the child, I am quite sure that it cannot be good for a small boy to have his penis manipulated daily by his mother.

When I examine all newborn babies immediately after birth to exclude congenital abnormalities, I always make a point of telling the mother that her son does not need circumcising. I advise her to wash and powder him well but to do no more. If then or at a later date she questions this advice, one must spend a little time explaining the protective function of the foreskin, and she must be assured that it will stretch as he gets older. In my practice the request for circumcision now hardly ever arises.

Ibstock, Leicester. C. A. H. WATTS.

SIR,—I feel sure that the large majority of doctors oppose this barbaric ritual and so welcome Sir Daniel's frank exposition of views. But perhaps he should have made just one or two more points. Although Nature's constancy is not to be denied, even if, on occasions, she has wondered whether the foreskin is really necessary,[1] I think that one or two of the complications of the unretracted foreskin should have been pointed out. Where the foreskin is left in situ (as it should be) by the family doctor he should ensure that at a suitable age, say over two years, a complete retraction of the prepuce is performed by himself. It is not at all uncommon for smegma to collect behind the corona in the boy whose foreskin is not retracted at intervals. This may become an irritant, and boys with such a collection often scratch about the genitalia. In front of this smegma the foreskin and glans are closely adherent. A further complication of this collection of smegma may be a subpreputial abscess which becomes apparent only when well advanced.

These disturbances, while they do not justify circumcision in infancy, are the kind of things that help to maintain the belief that circumcision is a good thing "and will save a lot of trouble later." Until proper and adequate education is given and acted upon by parents, this controversy will continue to recur.

Pinelands, Cape Province. THEODORE JAMES.

SIR,—In South Africa where we see hundreds of Bantus who are circumcised by their "witchdoctors," not according to laws of asepsis but according to the laws of the jungle, it is interesting to note that the uncircumcised seldom present themselves with gonococcal warts. On the other hand, the "unclean" natives often have some form of balanitis, paraphimosis, or epithelioma; and I once found actinomycosis of the prepuce in a native whose job was cleaning stables.

Where cleanliness is a major consideration circumcision is, in my view, essential. The non-European races do not wash their sexual organs very often and the only means of cleaning the seminal secretions off the glans is to have an exposed coronal sulcus.

London, N.16. SAMUEL MILLER.

SENSITIVITY TO PHENOBARBITONE

SIR,—In the belief that early recognition of phenobarbitone sensitivity was important because severe reactions might lead to death, Dr. Leishman and I described 4 such cases last year.[1] It was our opinion that severe reactions to phenobarbitone were more common than was generally realised and that the diagnosis was often missed. Our article does not seem to have been read by your annotator (Sept. 12) or by McGeachy and Bloomer.[2] Our findings were very much the same as those of McGeachy and Bloomer, though in 3 of our 4 cases, the patients were over the age of 50. A feature of the syndrome worth stressing is that improvement does not necessarily follow withdrawal of the phenobarbitone. The condition may continue for ten to fourteen days after withdrawal and, in fact, an irreversible state ending in death may occur. McGeachy and Bloomer suggest that corticotrophin (A.C.T.H.) or cortisone should be tried. We used intravenous corticotrophin on an apparently moribund woman suffering from phenobarbitone sensitivity. Within twenty-four hours there was a dramatic improvement and despite the complication of staphylococcal pneumonia she recovered fully within a month. Corticotrophin would appear to be the treatment of choice in the very severe cases.

With the widespread use of phenobarbitone it is likely that more and more examples of acquired sensitivity to the drug will be seen, and your annotation stresses quite rightly that the possibility of severe reactions to phenobarbitone should be more widely recognised, though fortunately they are at present rare.

Sheffield. I. B. SNEDDON.

GLUTAMIC ACID IN HEPATIC COMA

SIR,—In your last issue Dr. Gershon, Dr. Trautner, and Dr. Trethewie report that patients can be aroused from hypoglycæmic coma by an intravenous injection of sodium succinate and suggest that this effect may be due to the same basic mechanism as the action of glutamic acid in hepatic coma.

It has been shown [3] that the arousal effect of intravenous succinate in hypoglycæmic coma is about equal to that of glycine, but much inferior to that of glutamate or arginine. On intravenous injection, all four substances induce a significant increase of the blood-adrenaline level. The intensity of this effect varies in the same order as the capacity of causing arousal. Other observations on the effects of intravenous or oral glucose administration,[4] of subconvulsive electrical stimulation of the brain [5] and of the injection of adrenaline itself [5]

1. *J. Anat., Lond.* 1951, **85**, 370.

1. Sneddon, I. B., Leishman, A. W. D. *Brit. med. J.* 1952, i, 1276.
2. McGeachy, T. E., Bloomer, W. E. *Amer. J. Med.* 1953, **14**, 600.
3. Weil-Malherbe, H., Bone, A. D. *J. ment. Sci.* 1952, **98**, 565.
4. Weil-Malherbe, H. *Biochem. J.* 1952, **52**, xi.
5. Weil-Malherbe, H. *J. ment. Sci.* 1949, **95**, 930.

have confirmed the close correlation between the blood-adrenaline level and the return of consciousness.

These results have strengthened the hypothesis previously put forward [6] that the effect of administering glutamic acid and related drugs is due to an unspecific mechanism of a pharmacological (more exactly a sympathomimetic) nature. There is as yet no convincing evidence for a connection between the pharmacological effects of glutamic acid and its functions in intermediary metabolism.

Research Department,
Runwell Hospital, near Wickford, Essex. H. WEIL-MALHERBE.

ANÆSTHESIA IN CARDIAC DISEASE

SIR,—In last week's editorial on this subject you did not mention a simple measure that adds to the safety of anæsthesia in patients with cardiac disease and others who are seriously ill. You rightly stated that the most dangerous moments are during induction. Danger is greatly increased should anoxic anoxia occur, as it is apt to, at this stage. This can be guarded against by administering oxygen from the anæsthetic apparatus for a few minutes before the anæsthetic is started and by continuing this administration during induction. For this purpose oxygen is allowed to flow freely through the by-pass, and the expiratory valve is left open so that re-breathing does not occur. In this way much of the nitrogen in the lungs is replaced by oxygen, which forms a reserve sufficient for several minutes. I am not original in suggesting this measure, but fear that it is too seldom practised and that as a result lives may occasionally be lost.

You went on to advise against the use of thiopentone in cases of adhesive pericarditis. It would be interesting to know which alternative agent you consider most suitable for induction in these patients.

St. Thomas's Hospital,
London, S.E.1. J. G. BOURNE.

*** We are indebted to Dr. Bourne for drawing attention to this simple measure, which is, as he states, too seldom practised. Parry Brown and Sellick [7] induce patients suffering from adhesive pericarditis with nitrous oxide, oxygen, and ether, after a preliminary cricothyroid injection of 10% cocaine. The disadvantage of this technique is the difficulty of achieving induction with satisfactory oxygenation, and many anæsthetists therefore prefer cyclopropane and oxygen. Here oxygenation is at all times complete and the danger from arrhythmias seems to be theoretical rather than practical, as Dr. Bourne himself has shown.[8]—ED. L.

PREVENTION OF POLIOMYELITIS

SIR,—I should like to answer one or two of the points raised by your correspondents on the subject of my article of Aug. 8.

First, I must apologise to Dr. Hamilton (Aug. 22) for appearing to underestimate the problem of tuberculosis, of whose size I am well aware. The phrase should have read "common *acute* communicable disease" and I hope he will accept this amendment.

Dr. Paul's analysis (Aug. 22) of deaths from poliomyelitis in quinquennial age-groups is very interesting, but I should like to challenge him on one point. He demonstrates that the first two quinquennia of life still show the highest number of deaths, and argues that this is evidence that we are more likely to be dealing with an "exalted" familiar virus than with a "new" virus, since "if the epidemic virus were a new one attacking a virgin community one would expect little or no age differentiation." But he ignores an important fact—that epidemic and endemic poliomyelitis are being notified as the same disease. My hypothesis does not demand that endemic poliomyelitis shall have disappeared; it is presumably still at work and we know that it has always attacked just those two age-groups which show the highest incidence in his figures.

COMPARISON OF DEATHS FROM "EPIDEMIC" AND "ENDEMIC" POLIOMYELITIS BY AGE-GROUPS

—	Deaths							
Years	0–5	5–10	10–15	15–20	20–25	25–30	30–35	35–40
a Total for 1947–51	490	331	225	270	268	282	238	161
b "Endemic" 1939 figures (×5)	195	150	115	80	45	45	30	20
c "Epidemic" figures for 1947–51 after subtracting *b*	295	181	110	190	223	237	208	141

If, therefore, we are to get a true picture of epidemic, as opposed to endemic, poliomyelitis deaths, we must subtract from the total for 1947–51 those which we would have expected to have resulted from endemic poliomyelitis alone. The result is interesting. Thus, I have obtained the "expected" endemic poliomyelitis deaths by multiplying the figures for 1939, which he takes as a typical endemic year, by five to represent a five-year period, and I have subtracted them from the total figures he gives for 1947–51, with the results shown in the accompanying table.

It will be seen that the apparent age differentiation for epidemic poliomyelitis was almost entirely explained by the inclusion of the endemic figures, particularly in the 5–10 quinquennium. It is true that the 0–5 age-group still has the highest incidence of all groups, but there are a number of possible explanations, notably the fact that this group is more exposed to one of the known precipitating factors—namely, immunisation procedures—than any other. This 0–5 age-group is to me particularly interesting, for it contains a group virtually unrepresented in the endemic figures—i.e., the infants of 6 months and under, in whom the disease was practically unknown in this country before the appearance of epidemic poliomyelitis. Since poliomyelitis immunity, like measles immunity, appears to be acquired from the mother and declines gradually during the first months of life, the sudden susceptibility of the infants in this age-group is to me further proof of the new susceptibility of an older age-group—their mother's—and further evidence in favour of an "immunogenically new" rather than an "exalted old" virus.

I am grateful to Dr. Breen (Aug. 22) for so neatly exposing the weakness of Dr. Ritchie Russell's argument (Aug. 15). Let me quickly say that I do not think transmission by personal contact is by any means the only consideration in poliomyelitis epidemics. Climate and other factors undoubtedly have a very definite effect on the incidence of the disease. Most of them are, however, both unpredictable and uncontrollable, and I therefore prefer to concentrate on the transmission of the virus, which after all is, apart from its human victim, the only sine qua non of the disease. Closure of schools and the outdoor life of the population in the summer may well work against the virus in a season which appears otherwise to favour it—witness the outbreaks of poliomyelitis in camps which replace schools at this time of year.

I shall deal with only one point in Dr. Ritchie Russell's letter. He says ". . . let us ensure that the fashionable insistence on isolation does not result in cases of poliomyelitis being isolated also from important medical facilities." There has of late been a too-ready acceptance of the astonishing assumption that if a patient with poliomyelitis dies in an isolation hospital he dies for lack of medical care, and if he dies in a general hospital, or more

6. Weil-Malherbe, H. *Physiol. Rev.* 1950, **30**, 549; *Biochemical Society Symposia*, 1952, **8**, 16.
7. Parry Brown, A. I., Sellick, B.A. *Anæsthesia*, 1953, **8**, 4.
8. Bourne, J. G. *Lancet*, 1952, ii, 705.

gloriously in a "polio unit," he dies in spite of it. Unfortunately some poliomyelitis cases die from the central lesions produced by the virus, wherever they are. In fact, as was pointed out recently in the correspondence columns of the *British Medical Journal*,[1] patients are as likely to receive skilled care in an isolation hospital, where nursing and medical experience of these cases has accumulated for many years, as elsewhere, where theory so often replaces experience—to the disadvantage of the patient.

Dr. Russell underestimates the infectiousness of the disease, and I think that his repeated quotation of the alleged absence of cases among those attending poliomyelitis patients last year in Denmark, where no isolation precautions were taken, is irrelevant to this country, where there *have* in fact been cases amongst hospital staff. Denmark's experience of poliomyelitis in the past has been quite different from ours, and there is no reason to believe that the two populations have in any way a comparable "immunological state." To quote Denmark's experience and deliberately ignore our own seems to me dangerously misleading.

Nuffield Department of Orthopædic Surgery, Wingfield-Morris Orthopædic Hospital, Oxford. MARGARET AGERHOLM.

PAIN IN CHRONIC GASTRIC ULCER

SIR,—My old friend and teacher, Wilfred Trotter, used to say there is only one way to criticise a hypothesis and that is to accept it. I have tried to follow this advice with the hypothesis that Mr. Kinsella advocates with such characteristic warmth in your issue of Aug. 22. In this paper Mr. Kinsella attributes ulcer pain to inflammation. I agree that it is extremely probable that the inflammatory processes in gastric and duodenal ulcer are concerned in the pathogenesis of pain. He, Palmer and Dragstedt, and Bentley have all shown that, at operation, squeezing the ulcer mass is painful, whereas squeezing the adjacent normal stomach is not. In this, gastric and duodenal ulcers behave, as he says, like inflammatory lesions of the skin with which mere physicians have a greater opportunity of becoming familiar. Lewis's experiments showed that in the skin there are two processes involved in the sensitisation of pain nerves to stimuli (e.g., mechanical or thermal) otherwise inadequate—namely, a local process spreading from the area of injury and a more widespread change apparently induced by an axon reflex. The evidence, Lewis concluded, was that both these sensitisations were due to the local release of chemical substances.

Mr. Kinsella clearly thinks that inflammation accounts for peptic ulcer pain, any rival hypothesis being anathema. My difficulty here is that inflammation is a very comprehensive term involving reactions which differ greatly in response to various agents and involve almost every ingredient to be found in the tissues of the body. Which of these numerous changes actually initiates the discharge of nerve impulses up the sensory nerves? In his paper of Aug. 22 Mr. Kinsella is silent on this subject, but in his book [2] he states that "In Chapter XI on the effective stimulus we have seen that compression of the nerve fibres is the essential factor, and that in inflammatory disease compression may become more readily effective on account of the sensitizing of nerve fibres by inflammation." As I understand him, he believes (*a*) that the nerve-endings in the ulcer mass are sensitised by chemical products released by the inflammatory process; and (*b*) that the onset and end of pain is due to the rise and fall in tissue tension in such an ulcer, the rise in tissue tension being the effective stimulus compressing the nerve-fibres. If this is a correct analysis of his hypothesis, then I am in agreement with the first part of the statement but not with the second. In the first place I cannot agree with him that this is the basis of pain in inflammation generally. It may be, but I know of no convincing evidence. He quotes in his book experiments on a boil on his own arm which convinced him that tissue tension was the factor; I made similar experiments on one patient with a whitlow which suggested that tissue tension was a factor, but not the only one. But I should hesitate to base a general principle on one experiment in one subject, particularly when the actual quantity under consideration—tissue tension—had not been measured. The actual mechanism by which tissue deformation, such as a prick or a crush, initiates impulses in pain fibres is, as far as I am aware, unknown; but I am doubtful whether Mr. Kinsella will find a general readiness of those working on these subjects to accept compression of nerve-fibres as even a very likely starter.

The experiments which Walter Palmer and Bonney and I carried out suggested to us that the development and decline of pain in peptic ulcer are due to the rise and fall in the acidity of the gastric fluid which comes into contact with the ulcer. These experiments are simple and can be repeated by anyone. But they take time and they require the same attention to detail as any scientific work. I would guess that Bonney and I put in about two man-years of work on them.

Some of the most striking features of ulcer pain are, however, known to all clinicians. Its behaviour is, for example, so characteristic that a diagnosis can be made on the features of the pain alone. Now there is nothing very striking about the location of the pain or its quality. What is so striking is its relation to meals and its relief by food, vomiting, and alkali, and particularly alkali. If I understand Kinsella rightly, he thinks that the appearance and disappearance of pain are due to rise and fall in tissue tension. But what events in the stomach and duodenum determine this almost predictable variation in tissue tension? Here I find Kinsella's arguments so complex and his actual evidence so nebulous that I part company with him at once.

In affirming my belief that it is the rise and fall of gastric acidity that is responsible for the appearance and disappearance of peptic ulcer pain, I would add that it is still an open question as to how this change in reaction of the gastric contents is translated into impulses travelling up the pain fibres. It is possible that a change in reaction in the tissue fluids surrounding these endings is the answer, or that acid produces tissue injury with the release of substances which themselves initiate the change in the endings. It is even possible that it is swelling of the tissues with rise in local tension, though I think this is unlikely, chiefly because the response can be so quick. Thus in our observations in gastric ulcer the administration of alkali began to relieve pain in 2 and relieved it completely in 8 minutes on an average.

I can thus only agree to a very limited extent with my friend, Mr. Kinsella. But I would like to add that he has my respect as one of those rare surgeons who unfailingly uses the opportunities which the exercise of his craft gives him to advance his and our understanding of the symptoms of which his patients complain. The history of medicine shows how often knowledge has been advanced by controversy. If our disagreement stimulates new work, I hope that one line will be the study of pain in naturally occurring inflammatory lesions of the skin and extremities, which are so much more accessible to observation, experiment, and measurement than are lesions of the stomach and duodenum. Here it would be possible to measure tissue tension in inflammatory lesions, and to see whether experimental measures to raise tissue tension to similar levels in normal tissues would initiate pain. Perhaps that would show to what extent Mr. Kinsella's views are right on the cause of pain in inflammatory lesions in general.

Medical Unit, St. Mary's Hospital, London, W.2. G. W. PICKERING.

1. Linehan, J. J. *Brit. med. J.* 1952, ii, 562.
2. The Mechanism of Abdominal Pain. Sydney, 1948.

Medicine and the Law

Drugs in the Wrong Bottle

EXHAUSTIVE inquiries, conducted with the aid of the police, failed to explain at a recent inquest at Wellingborough [1] how a bottle marked phenobarbitone came to contain tablets of biniodide of mercury. The deceased, an elderly patient under treatment in hospital for epilepsy, was ordered a daily dose of one grain of phenobarbitone. Preparing to administer the dose on August 6, the matron took a bottle marked phenobarbitone. She told the coroner that she noticed that the tablets looked bigger than usual, but she assumed that they were a new type of phenobarbitone. She did not realise that anything was amiss until the patient was taken ill; she then rang up the dispenser and sent the tablets for examination; they were found to contain biniodide of mercury. The patient died six days later from mercury poisoning.

Several members of the hospital staff gave evidence. The coroner, stating that he was satisfied that none of the persons interviewed had been at fault, recorded a verdict of accidental death, adding that this disastrous incident would be a lesson to hospital workers all over the country.

Name Removed from Medical Lists

A TRIBUNAL constituted under the National Health Service (Scotland) Act has directed that a doctor's name be removed from the medical lists of the executive councils for the counties of Angus, Aberdeen, and Kincardine and that he pay the complainer's expenses of the hearing. The tribunal regards the case as a serious one and states that the evidence disclosed a gross neglect of the practitioner's duties over a considerable period and a widespread disregard of the needs of his patients within the National Health Service.

The findings of fact may be summarised as follows. Since the end of March last the doctor has not carried on practice personally; his patients have been looked after by various doctors acting as locum tenens. Last December, January, and February he frequently failed, without reasonable cause, to attend at his surgery during consulting hours. The only intimation to his patients was either a notice on the surgery door "Doctor gone—no surgery" or a verbal statement from a member of his household that he was not consulting. On these occasions he made no arrangements for patients' treatment. Last December a telephone message and personal message were left at his house to tell him that Mrs. A was seriously ill and to ask him to call and attend her. He did not call, nor did he inquire about her condition; she had to receive attention from another doctor. A similar message two days later was also ignored. Last January Mrs. B, as he was aware, was in her 9th month of pregnancy. She had a fall in the middle of the month. He had seen her in her 3rd and 6th months and was to arrange for her confinement at home. He was repeatedly asked to call upon her in January but did not do so till the baby was born at the end of the month, nor did he tell her what arrangements had been made. In February Mrs. C, who, as he knew, was pregnant, had a hæmorrhage at her home. He was asked by telephone to visit her; he ignored the message; another doctor was called in, who later arranged for her to be examined radiographically and admitted to hospital. The late Mr. D, a patient with cancer, was discharged from hospital at Christmas and attended daily as an outpatient till Jan. 16. During that period and for several weeks thereafter he suffered great pain. The respondent doctor visited him on Dec. 26 but, despite repeated requests, did not see him again during January.

1. *Northampton Mercury*, Aug. 28, 1953.

The various complaints were sent to the respondent doctor with a request for his observations. He made no answer or acknowledgment and offered no explanation. He did not attend the meetings of the local medical service committee in February, 1952, or March, 1953, when the complaints were considered. He was not represented at the hearing before the tribunal; he attended the hearing himself but, owing to a misunderstanding, arrived late; he conducted his own case and gave evidence, calling no other witness.

The tribunal consisted, as the Scottish Act requires, of a chairman appointed by the Lord President of the Court of Session, one member appointed by the Secretary of State in consultation with the Scottish Association of Executive Councils, and one member drawn from a panel representing the medical profession. It recorded its findings with regret because "the respondent had an excellent practice and we believe that he is potentially a capable doctor who, if he would take a grip on himself and apply his mind wholeheartedly to his duties, could be a useful member of the medical profession."

Public Health

Poliomyelitis

POLIOMYELITIS notifications (uncorrected) in the week ended Sept. 5 (the 35th week of the year) were (previous week in parentheses): paralytic, 123 (120); non-paralytic, 101 (117); total, 224 (237).

The following table compares this year with the preceding six years:

Year	Total cases up to and including 35th week	Cases in 35th week
1947	4277	657
1948	1140	73
1949	2341	308
1950	4616	491
1951	1836	89
1952	2605	215
1953	3305	224

The districts which have notified 20 or more cases in the year up to Sept. 5 are:

District	Total cases (in 35 weeks)	Incidence per 100,000 of population
Southend-on-Sea	47	31·02
Liverpool	56	7·08
Birmingham	68	6·08
Coventry	124	47·51
Leicester	30	10·49
Lewisham	26	11·45
Blackpool	32	21·72
Camberwell	22	12·14
Islington	26	11·05
Bournemouth	40	28·00
Bristol	28	6·31
Nottingham	25	8·05
Taunton	28	80·92
St. Pancras	23	16·48
Carlisle	26	38·29
Manchester	23	3·26
Wandsworth	21	6·33
Southampton	21	11·97
Atherstone	21	88·61
Leeds	22	4·36
Cambridge	20	22·04
West Ham	20	11·73
Kingston-upon-Hull	22	7·35

Although there was a small decrease in the total notifications compared with the preceding week, there was an increase of 3 in the number of paralytic cases. Notifications remain high in certain areas, but the disease is widely distributed and there is no indication of the development of an epidemic.

Appointments

GARAI, JOAN, M.R.C.S., D.P.M.: clinical asst. (S.H.M.O.), psychiatric department, Royal Free Hospital group.

GRANT, D. K., M.B. Adelaide, M.R.A.C.P.: house physician, The Hospital for Sick Children, Great Ormond Street, London.

JENKINS, D. H., M.S. Lond., F.R.C.S.: consultant general surgeon, United Cardiff Hospitals, and the Welsh Regional Hospital Board.

LAST, S. L., M.D. Berlin, D.P.M.: part-time consultant, department of electro-encephalography, London Hospital.

LINDOP, RICHARD, M.B. Birm., D.C.H.: asst. M.O.H. and school M.O., West Bromwich.

WEIR, H. C., M.A., M.B. Dubl.: asst. M.O., public health department, Gateshead.

Obituary

BERNARD SANGSTER SIMMONDS
M.S. Lond., F.R.C.S.

Mr. Sangster Simmonds, consulting surgeon to the West London Hospital, died suddenly on Sept. 3, at the age of 66, while on holiday in South Africa.

Bernard Sangster Simmonds was born on Dec. 8, 1886, and was educated at Bancroft's School. He received his medical training at the Middlesex Hospital, qualifying M.R.C.S. in 1910 and graduating M.B. Lond. in 1912. At his medical school he held the appointments of house-surgeon, house-physician, and casualty officer. After a period in general practice he joined the R.A.M.C. in 1916 and served in France. Within a year after demobilisation in 1920 he obtained both the F.R.C.S. and the M.S. and he became surgeon to the Ministry of Pensions. In 1921 he was appointed to the surgical staff of the West London Hospital, and for many years he worked in close and congenial association with the late H. Tyrrell Gray. In 1924 he went on the staff of Hounslow Hospital, and in 1941 on the staff of Maidenhead Hospital. During the late war he was group surgical adviser to sector 7 in the Emergency Medical Service.

[Lafayette

G. F. G. B. writes: "Sangster Simmonds's life was marked by the catholicity of his interests and his public spirit, and he attained distinction by hard work and application. His was the genius that has an infinite capacity for taking pains. In the theatre meticulous care and accuracy was the hallmark of his surgical technique, and his clinical judgment was such that almost automatically his advice was sought in cases of difficulty. He was in the forefront of those who strive to improve hospital administration and organisation, and in this direction his energies obtained an outlet through his membership of the council of King Edward's Hospital Fund for London and his close association with the board of governors of the Hammersmith, West London, and St. Mark's Hospitals. In particular he worked hard to improve the conditions of service of nurses under training at the West London Hospital. On the court of the Drapers' Company he took an active interest in the schools associated with the company and received the unusual distinction of being appointed Master for two years in succession. He was keenly interested in Freemasonry and was a member of Grand Lodge. Sangster Simmonds was of those who could ill be spared, and with his death the community has lost a valued servant and his colleagues and patients a trusted and loyal friend."

O. L. C. S. adds: "All who knew Bernard Simmonds will remember him as a big man, slow and deliberate in speech and completely imperturbable. In the operating-theatre no-one ever saw him ruffled or uncertain. His surgery was never spectacular, but meticulous and neat, and his patients all held him in the highest regard. At the hospital his great interest was in the welfare of the nurses, and one of his last activities was the organisation of a nurses' dance in aid of increased social amenities for the nursing staff. In later years his shrewd judgment and common sense were applied to business with considerable success; and the fact that he was asked to take on the Mastership of a city company for a second year is proof of the high regard in which he was held in the City. His business ability was always at the disposal of the numerous medical and charitable committees of which he was a member.

"He was essentially gregarious, and his delightful country house was generally full of visitors. We shall miss the sight of his cheerful figure."

In 1914 Mr. Sangster Simmonds married Miss Elsie Mary Barwell, who survives him.

Notes and News

AMPUTATION STUMPS

WITHIN the Brussels Treaty Organisation there are several subcommittees and working parties which discuss questions of mutual interest, one of which is the care and reablement of the disabled and the provision of artificial limbs. At the meeting of the subcommittee of the prosthetic working party in Utrecht last February, which was attended by experts in prosthesis from Britain, France, Belgium, the Netherlands, and Luxembourg, certain lengths of amputation stump were agreed as "ideal" for adult males of average height. The above-knee stump should measure 10–12 in. from the tip of the greater trochanter, and the below-knee stump $5^1/_2$ in. from the inner articular surface of the head of the tibia. The Stokes-Gritti amputation was not favoured by any country, and France alone supported the transmetatarsal amputation of the foot. Foot amputations were not generally recommended, and Britain was alone in favouring the modified Syme amputation in selected cases. The Pirogoff, Chopart, and Lisfranc amputations were not popular, but the Netherlands thought that the Pirogoff and Lisfranc amputations might be valuable in exceptional cases. No country favoured disarticulation at the hip, and only Britain advocated disarticulation at the knee in certain elderly patients and in children and adolescents.

The subcommittee thought that the ideal upper-arm stump measured 8 in. from the tip of the acromion and that the best forearm stump was 7 in. from the tip of the olecranon. No-one supported disarticulation at the shoulder or the elbow, and only the Netherlands commended disarticulation at the wrist in special circumstances. All the representatives agreed that as much sensitive and scar-free tissue as possible should be conserved in attempting to retain a functionally useful hand or part of a hand.

Maximum and minimum lengths of stumps were also discussed in relation to limb-fitting with the average type of artificial limb, and it was agreed that a femur should not be less than 6 in. or more than 12 in. in length, though Britain felt that the fitting of some patients with a stump of less than 6 in. was sometimes possible. There was general agreement that the below-knee stump should not be shorter than 2 in. or longer than 6 in. In arm amputations, the subcommittee thought that the end of the above-elbow stump should lie between a point 1 in. below the pectoralis-major tendon and $3^1/_2$ in. above the elbow joint if the most useful type of artificial arm was to be fitted and adequately controlled. A forearm stump should not be less than $3^1/_2$ in. or more than 8 in. from the tip of the olecranon, the Netherlands again advocating the retention of the through-wrist amputation in special cases.

EXCERPTA MEDICA

THE International Medical Abstracting Service, known as *Excerpta Medica*, has published a new section (no. 16) devoted solely to cancer. Like the previous 15 sections, which cover almost every branch of clinical and experimental medicine, this latest volume consists of abstracts in English from medical journals throughout the world. The publication of this new section has been aided by grants from the National Cancer Institute of the Public Health Service and the American Cancer Society. It is controlled by an editorial board of more than 30 experts, representing many different nationalities. The first number, dated July, 1953, contains 424 abstracts. It will be published each month, and the annual subscription in Great Britain and other sterling countries is £3 15*s*.

HOSTEL FOR DEAF CHILDREN

A NEW type of experimental hostel for deaf children and their mothers was opened last Monday at Castlebar Hill, Ealing, by Mr. Iain Macleod, the Minister of Health. Provided by the Royal National Throat, Nose, and Ear Hospital out of their endowment funds, it will give an opportunity for testing methods of treating and training deaf children under school age and will also enable the hospital to experiment in methods of instructing parents in the management of deaf children. Mr. Macleod, who said that the experiment would be watched with interest by his department, urged coöperation between the management of the hostel and the local welfare authority: it might be useful if the responsible welfare officer were to visit the hostel during the stay of

mothers and children for whom he would have a responsibility after their discharge. At present, the Minister stated, not more than 62% of local authorities in England and Wales have decided to exercise their power to provide welfare services for the deaf and dumb under the National Assistance Act, 1948. He mentioned that children, who all over the country have been given priority for hearing-aids, are to be provided, where they can benefit from it, with a 'Medresco' aid in which the batteries are incorporated in the aid and not carried separately; but it will be some considerable time before these are made available.

University of London

On Oct. 26, 27, 28, 29, and 30, at 5.30 P.M., at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, Dr. Paul F. Russell, of the division of medicine and public health of the Rockefeller Foundation, will deliver a course of Heath Clark lectures on Man's Mastery of Malaria.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the faculty on Sept. 7, with Dr. Andrew Allison, the president, in the chair, the following were admitted fellows of the faculty:

Ernest Armitage, Sanjogta Sachdev (*qua* physician); R. S. Cowie (*qua* surgeon).

Royal College of Obstetricians and Gynæcologists

Mr. James Walker will give the Blair-Bell lecture on Friday, Sept. 25, at 5 P.M. His subject will be Fœtal Anoxia—a Clinical and Laboratory Study. On Friday, Oct. 16, at 2.45 P.M., Mr. J. W. Bride will deliver the William Meredith Fletcher Shaw lecture. He is to speak on Some Manchester Pioneers in Obstetrics and Gynæcology. Both lectures will be given at the college, 58, Queen Anne Street, London, W.1.

London Hospital Medical College

On Thursday, Oct. 8, at 5 P.M., Sir James Spence will deliver the Schorstein lecture at the college. He has chosen as his subject the Varieties of Clinical Experience.

Royal Institute of Public Health and Hygiene

On Wednesday, Oct. 14, at 4 P.M., General A. M. E. Sicé, professor of tropical medicine in the University of Basle, will deliver the Bengué Memorial Award lecture at the institute, 28, Portland Place, London, W.1. He will speak on the Evolution of Therapeutics in the Course of the Last Few Years.

Society of Apothecaries of London

Liverymen of the company are summoned to appear at Guildhall, on Tuesday, Sept. 29, at 10.30 A.M. After a service at the church of St. Margaret, Lothbury, they will return to Guildhall for the election of a lord mayor (12 NOON).

Medical Society for the Study of Venereal Diseases

A general meeting of the society will be held at 6.45 P.M. on Friday, Sept. 25, at 11, Chandos Street, Cavendish Square, London, W.1, when Dr. R. L. Kahn (U.S.A.) will read a paper on Clarifying Syphilitic and Non-Syphilitic Sero-diagnostic Reactions.

Chadwick Trust

Sir Allen Daley has been appointed a Chadwick trustee.

The function of the trustees is to propagate Chadwick's "sanitary idea" by arranging public lectures, by making grants to educational institutions, and by presenting medals and prizes.

The first lecture of this session will be given by Mr. C. J. Regan, F.R.I.C., chemist-in-chief of the London County Council, at the Royal Society of Arts, John Adam Street, London, W.C.2, on Thursday, Oct. 15, at 5.30 P.M. He is to speak on Air Pollution. Admission is free. Programmes for 1953–54 may be had from 204, Abbey House, S.W.1.

Meetings of W.H.O. Committees

The Regional Committee for Europe met from Sept. 7 to 10 in Copenhagen to consider the report on 1953 presented by Dr. Norman Begg, the regional director, and to discuss the programme of the regional office for 1954 and 1955. The budget proposed for health work in the European region in 1955 is approximately $1,600,000.

A W.H.O. Committee on rabies met in Rome on Sept. 14 to study improvements in vaccines for human and veterinary use.

Royal Appointment

Air Commodore P. B. L. Potter has been appointed an honorary surgeon to the Queen in succession to Air Vice-Marshal W. E. Barnes, who is retiring from the Royal Air Force.

London Hospital

On Thursday, Sept. 24, at 4.15 P.M., Dr. Stephen Rothman (Chicago) will speak at the hospital on Physiology of the Skin.

Society for Cultural Relations with the U.S.S.R.

Dr. Brian Kirman, who is at present visiting the Soviet Union, will describe his visit at a meeting of the society on Tuesday, Oct. 6, at 7.30 P.M., at 14, Kensington Square, London, W.8.

Medical Officers of the London Amateur Boxing Association

The annual general meeting will be held at 69, Victoria Street, London, S.W.1, on Tuesday, Sept. 29, at 8.30 P.M. All doctors interested in amateur boxing are invited to attend.

Central Middlesex Hospital

Mr. Grayton Brown, surgeon to the Royal Melbourne Hospital, will give a lecture at this hospital, Park Royal, London, N.W.10, on Monday, Sept. 28, at 5.30 P.M. He is to speak on the Surgical Treatment of Duodenal Ulcer by Antro-duodenectomy.

London Nursing Exhibition

The 38th London Nursing Exhibition and Professional Nurses and Midwives Conference, organised by the *Nursing Mirror*, will be opened at the Seymour Hall, London, W.1, at 11 A.M. on Monday, Oct. 12, by Mrs. Iain Macleod, wife of the Minister of Health. The exhibition and conference is under the patronage of Princess Marie Louise, and its president will be Sir William Gilliatt. The exhibition will be open until Oct. 16.

Wellcome Foundation

Dr. J. W. Trevan, F.R.S., has retired from his appointment as research director of the Wellcome Foundation and director of the Wellcome Research Laboratories, Beckenham, after over 33 years' service with the company. His successor is Mr. D. W. Adamson, D.PHIL., formerly head of the chemical division of laboratories.

International Congress of Scientific Films

During this congress, which is being held in London from Sept. 18 to 27, medical film programmes are being arranged at the National Film Theatre, on the South Bank. Admission is free to doctors. On Monday, Sept. 21, at 10 A.M., films on general medicine will be shown; on Friday, Sept. 25, at 10 A.M., on pathology; and on Saturday, Sept. 26, at 10 A.M., on anæsthetics. Public-health films from many nations will be shown on Monday, Sept. 21, at 8 P.M., and this programme will be open to the public. Further particulars may be had from the Secretariat of the Scientific Film Association, 164, Shaftesbury Avenue, W.C.2.

CORRIGENDUM: *The Bacteriology of Chronic Bronchitis.*—In this article by Dr. J. Robert May (Sept. 12, p. 534) the second group of tabular matter under the heading "table IV" should have accompanied fig. 2, and the third group of tabular matter under this heading should have accompanied fig. 3.

Prof. E. M. Jellinek has compiled a summary of the proceedings of the European seminar and lecture course on Alcoholism held in Copenhagen from Oct. 22 to Nov. 3, 1951. A limited number of copies are available for those who attended the seminar and for libraries and health institutions. Applications should be sent to the regional office for Europe of the World Health Organisation, Palais des Nations, Geneva, Switzerland.

The seven sections of the National Nutrition Survey of Eire, which have appeared separately during the last five years, have now been published in one volume. Copies (*2s.*) may be had from the government publications sale office, 3–4, College Street, Dublin.

Births, Marriages, and Deaths

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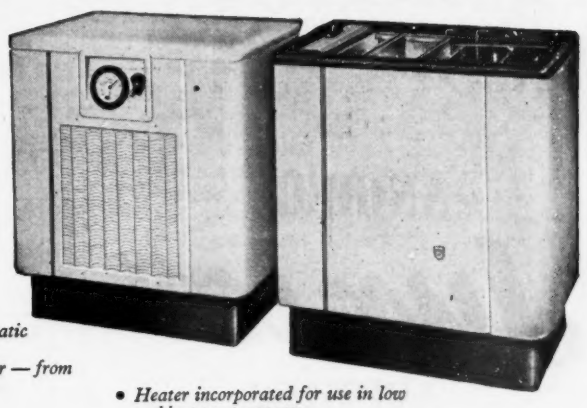

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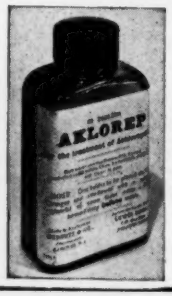

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NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

Vacancies

ACADEMIC AND EDUCATIONAL SECTION — Page 33

ANÆSTHETICS

Mothers', E.5. Sr. H.O. 36
Westminster, S.W.1. Sr. H.O. .. 37
Ashford, Middx. H.O. 37
Birmingham. Dudley Road. Sr. H.O.'s 38
Blackburn & Dist. H.M.C. Sr. H.O... 38
Blackpool. Vic. Sr. H.O. 38
Bradford Royal. H.O. 39
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. & H.O. 38
Chertsey. St. Peter's. Sr. H.O. .. 40
Coventry Hosps. Sr. H.O. 40
Darlington Mem. Sr. H.O. 40
Dartford H.M.C. Sr. H.O. 40
Halifax Area H.M.C. Jr. H.M.O. .. 41
Leeds R.H.B. Sr. H.M.O. 34
Leeds R.H.B. Reg. 42
Manchester R.H.B. Sr. H.M.O. .. 35
Manchester R.H.B. Regs. 44
Mansfield & Dist. Gen. Sr. H.O. .. 43
Northampton Gen. H.O. 44
North East Met. R.H.B. Reg. .. 36
Nottingham Gen. Sr. H.O. 44
Plymouth. South Devon & East Cornwall. H.O. 45
Poole Gen. Sr. H.O. 44
Rochester. St. Bartholomew's. Sr. H.O. 45
Rotherham. Moorgate Gen. Reg. .. 45
Sheffield City Gen. Sr. H.O... .. 45
Sheffield R.H.B. P.-t. Cons... .. 35
Sheffield R.H.B. Reg... 45
Sheffield R.H.B. Locum Sr. H.M.O. 35
Shrewsbury. Royal Salop Infy. & Copthorne. Sr. H.O. 46
Slough. Upton. Reg... 46
Slough. Upton. Locum Reg. .. 46
South East Met. R.H.B. P.-t. Cons... 35
South West Met. R.H.B. Locum Cons. or Sr. H.M.O. 35
Stafford H.M.C. Sr. H.O. 47
St. Albans City. Locum Reg. .. 47
Swansea. Sr. H.O.'s 47
Truro. Royal Cornwall Infy. Sr. H.O. 47
Welsh R.H.B. Cons. 35

CASUALTY

Battersea Gen., S.W.11. H.O. or Sr. H.O. 35
Hackney, E.9. H.O. 35
Lewisham, S.E.13. Sr. H.O. 35
Memorial, S.E.18. Sr. H.O... .. 35
Princess Beatrice, S.W.5. H.O. .. 36
Royal Northern, N.7. Reg. 36
St. Mary's, W.2. Sr. H.O. 36
St. Mary's Hosp. for Women & Children, E.13. Sr. H.O. 37
Barnsley. Beckett. Reg. 37
Brighton. Royal Sussex County. Pre-reg. H.O... 39
Brighton Gen. H.O. 39
Chelmsford & Essex. Sr. H.O. .. 39
Colchester. Essex County. H.O. .. 40
Croydon Gen. Sr. H.O. 40
Doncaster Royal Infy. Sr. H.O. .. 41
Edgware Gen. Sr. H.O. 41
Grimsby Gen. Sr. H.O. 41
Hastings. Royal East Sussex. Sr. H.O. 41
Hull Royal Infy. Sr. H.O. 41
Liverpool United Hosps. Temp. H.O.'s 43
Northampton Gen. Sr. H.O. & H.O. 44
Plymouth. South Devon & East Cornwall. Sr. H.O.'s 45
Romford. Oldchurch. Sr. H.O. .. 45
Slough. Upton. Locum Sr. H.O. .. 46
Slough. Upton. Sr. H.O. 46
Southend-on-Sea Gen. Sr. H.O. .. 46
Warrington Infy. Jr. H.M.O. .. 48
Wolverhampton H.M.C. H.O. .. 48
Channel Islands. Jersey. Gen. H.O. 48

CARDIOLOGY

National Heart, W.1. Sr. Reg. .. 36

CHEST AND TUBERCULOSIS

Hosp. for Sick Child., W.C.1. Sr. Reg. 37
North West Met. R.H.B. Sr. H.M.O. 34
Plaistow, E.13. H.O... 36
Ashford. Grosvenor San. R.M.O. .. 37
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. or Locum H.O. 37
Birmingham R.H.B. Reg. 38
Camborne. Tehidy Chest. H.O. .. 39
Chelmsford. Broomfield. Locum Sr. H.M.O. 34
Chepstow. Mon. Mem. Wards. Jr. H.M.O. 39
Cottingham, E. Yorks. Sr. H.O. & Jr. H.M.O. 40
Dagenham. Jr. H.M.O. 40
Hull B Group H.M.C. Locum Sr. H.O. 42
Leeds R.H.B. Sr. H.M.O.'s 34
Liverpool. Broadgreen. Sr. H.O. .. 42
Liverpool R.H.B. Sr. H.M.O. .. 34
Liverpool. Walton. Sr. H.O. .. 42
Maidstone. Lenham San. Sr. H.O. .. 43
Manchester. R.H.B. Reg. 43
Manchester. West Manchester H.M.C. Sr. H.O. 44
Mansfield. Ransom San. Sr. H.O. .. 43
Newcastle R.H.B. Sr. H.M.O. .. 35
North East Met. R.H.B. Reg. .. 36
Skipton. Middleton & Grassington Group. H.O. or Sr. H.O. 46
South East Met. R.H.B. Reg. .. 46
St. Helens. Eccleston Hall. Sr. H.O. 47
Swansea. Morriston. Sr. H.O. .. 47
Ventnor I.W. Royal Nat. Hosp. for Diseases of Chest. Jr. H.M.O. .. 47
Yorkshire. East Riding H.M.C. H.O. 48

DENTAL SURGERY

Leeds R.H.B. Sr. H.D.O. 34
Plymouth. South Devon & East Cornwall. H.O. 45
Northern Ireland Hosps. Auth. Reg. or Sr. H.O. 48

DERMATOLOGY

St. Mary's, W.2. Sr. Reg. (Temp.) .. 36
Liverpool United Hosps. Reg. .. 43

EAR, NOSE, AND THROAT

Royal Nat. T.N. & E. Sr. Reg. & Reg. 36
Royal Nat. T.N. & E. H.O... 36
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. 37
Blackpool. Vic. Sr. H.O. & H.O. .. 38
Bradford. Royal Eye & Ear. H.O... 39
Brighton Group Hosps. H.O.'s .. 39
Dartford H.M.C. H.O. 40
Doncaster Royal Infy. Sr. H.O. .. 41
East Cumberland H.M.C. H.O. .. 41
Glasgow. Southern Gen. H.O.'s .. 41
Hull Royal Infy. Sr. H.O. 41
Leeds R.H.B. P.-t. Cons. 34
Maidstone. Kent County Ophthalmic & Aural. Sr. H.O. 43
Manchester R.H.B. Reg. 44
Manchester. West Manchester H.M.C. Pre-reg. H.O. 44
Swansea. Sr. H.O. 47
Truro. Royal Cornwall Infy. Pre-reg. H.O. 47
Wolverhampton H.M.C. H.O. .. 48

INFECTIOUS DISEASES

Neasden, N.W.10. Locum Reg. .. 36
Leeds R.H.B. Reg. 42
Middlesbrough. West Lane Isolation. Sr. H.O. 44
Portsmouth Group H.M.C. Sr. H.O. 45

MEDICINE

Lambeth, S.E.11. H.O. 35
London, E.1. Reg. 35
Miller Gen., S.E.10. H.O. 36
Paddington Green Children's, W.2. Pre-reg. H.O... 36
Queen Mary's (Roehampton), S.W.15. Sr. H.O. 36
St. James', S.W.12. Sr. H.O... .. 36
St. Stephen's, S.W.10. H.O... .. 37
Willesden Gen., N.W.10. Reg .. 37
Accrington. Victoria. Sr. H.O. .. 37
Ashford. Kent. Willesborough. H.O. 37
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. 37
Bedford Gen. Reg. 38
Bishop's Stortford & Dist. Hosp. H.O. 38
Bishop's Stortford. Haymeads. H.O. 38
Bournemouth & East Dorset H.M.C. H.O. 39
Bournemouth. Royal Vic. H.O. .. 39
Brechin. Stracathro. Pre-reg. H.O... 39
Bristol. Stapleton. Jr. H.M.O. .. 38
Bury & Rossendale H.M.C. Sr. H.O. 37
Carshalton. Queen Mary's Hosp. for Child. H.O. 39
Coventry. Gulson. H.O. 40
Coventry & Warwickshire. H.O. .. 40
Deal. Vic. H.O. 40
Dewsbury. Staincliffe Gen. Jr. H.M.O. 41

(continued overleaf)

Vacancies (*continued*)

Folkestone. Royal Vic. H.O. .. 41
Hertford County. H.O. 41
Hull Royal Infy. H.O.'s 41
Leeds R.H.B. Reg. 42
Leigh Infy., Lancs. H.O. 42
Liverpool. John Bagot. Jr. H.M.O. .. 43
Liverpool. Walton. H.O.'s .. 43
Louth. County Infy. Sr. H.O. .. 43
Luton & Dunstable. H.O. 43
Newark Gen. Sr. H.O. 44
Nuneaton. Manor. H.O. 44
Plymouth. South Devon & East Cornwall. H.O. 45
Romford. Vic. H.O. 45
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 47
Swansea. Mount Pleasant. Jr. H.M.O. 47
Taplow. Canadian Red Cross Mem. H.O. 47
Tunstall. Burslem, Haywood & Tunstall War Mem. H.O. 47
Worksop. Kilton. Reg. 47
Yorkshire. East Riding H.M.C. H.O. 48

NEUROSURGERY

Bristol Clinical Area. Sr. Reg. .. 39
Bristol. Cossham/Frenchay, H.M.C. Locum H.O. 39
Leeds United Hosps. Sr. H.O. & H.O. 42

OBSTETRICS AND GYNÆCOLOGY

Annie McCall Maternity, S.W.4. H.O. 35
British Hosp. for Mothers & Babies, S.E.18. Sr. H.O. 35
East End Maternity, E.1. H.O. .. 35
North East Met. R.H.B. Regs. .. 36
North Middlesex, N.18. H.O. .. 36
Bath Clinical Area. Reg. 37
Birmingham, Marston Green Maternity. H.O. 38
Blackpool. Victoria. H.O. 38
Bury & Rossendale H.M.C. Sr. H.O. 37
Chertsey. St. Peter's. Sr. H.O. .. 40
Dartford H.M.C. H.O. 40
Derby City & Queen Mary Maternity. Home. H.O. or Sr. H.O. 40
Dorking Gen. Sr. H.O. 40
Grimsby Gen. Sr. H.O. 41
Grimsby Maternity. Sr. H.O. .. 41
Hull. Maternity. H.O. 42
Leeds. St. James's. H.O. 42
Louth. County Infy. Sr. H.O. .. 43
Plymouth. South Devon & East Cornwall. H.O. 45
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 47
Wakefield. Pinderfields Gen. Locum H.O. 48
Winchester. Royal Hants County. H.O. 48
Wolverhampton H.M.C. H.O. .. 48

OPHTHALMOLOGY

Royal Eye, S.E.1. Sr. H.O. 36
Royal Northern, N.7. Sr. H.O. .. 36
Bradford. Royal Eye & Ear. H.O. .. 39
Derby. Derbyshire Royal Infy. Sr. H.O. 40
Manchester United Hosps. Reg. .. 43
Newcastle United Hosps. Reg. .. 44
Romford. Oldchurch. Sr. H.O. .. 45
Wolverhampton H.M.C. H.O. .. 48

ORTHOPÆDICS

King Edward Mem., W.13. Sr. H.O. 35
Royal Northern, N.7. Reg. 36
St. James', S.W.12. Sr. H.O. 36
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Sr. H.O. 37
Bournemouth & East Dorset H.M.C. Reg. 39
Bradford. St. Luke's. Sr. H.O. & H.O. 39
Bradford Royal. H.O. 39
Braintree. Black Notley. Locum Sr. H.O. 39
Braintree. Black Notley. H.O. .. 39
Cardiff United Hosps. Sr. H.O. .. 39
Dartford H.M.C. H.O. 40
East Cumberland H.M.C. H.O. .. 41
Hull Royal Infy. H.O. 41
Inverness Hosps. B.O.M. H.O.'s .. 42
Ipswich. East Suffolk & Ipswich. Sr. H.O. & H.O. 42
Leeds R.H.B. Regs. 42
Liverpool. Walton. H.O. 43
Liverpool United Hosps. Sr. H.O. .. 43
Liverpool United Hosps. Temp. H.O.'s 43
Manchester R.H.B. Reg. 43
Northampton Gen. H.O. 44
Nottingham Gen. Sr. H.O. 44
Nottingham Gen. Locum Reg. .. 44
Nottingham Gen. Reg. 44
Peterborough Mem. Sr. H.O. .. 44
Scotland. South-Eastern R.H.B. Sr. Reg. 45
Shrewsbury. Royal Salop Infy. Sr. H.O. 46
Sidcup. Queen Mary's. Sr. H.O. .. 46
Southampton. Royal S. Hants. H.O. 46
Stoke-on-Trent Group of Hosps. Sr Reg. 47
Stoke-on-Trent. North Staffs Royal Infy. H.O. 47
Swansea. Sr. H.O. 47
Truro. Royal Cornwall Infy. Sr. H.O.'s. 47
Whitehaven. Cumberland. H.O. or Sr. H.O. 48
Winchester. Royal Hants County. Sr. H.O. 48
Wolverhampton H.M.C. Sr. H.O. or H.O. 48
Yorkshire. East Riding H.M.C. Sr. H.O. 48

PÆDIATRICS

Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. 37
Blackburn & Dist. H.M.C. Sr. H.O. .. 38
Bolton District Gen. H.O. 39
Bradford Children's. H.O.'s. 39
Bradford. St. Luke's. H.O. .. 39
Derby. Derbyshire Childs. Pre-reg. H.O. or Sr. H.O. 40
Hemel Hempstead. West Herts. H.O. 41
Oxford R.H.B. Reg. 44
Pontefract & Castleford H.M.C. Sr. H.O. 45
Shrewsbury. Royal Salop Infy. Sr. H.O. or H.O. 46
Southampton Child's. H.O. 46
Stoke-on-Trent. City Gen. H.O. .. 47
Wrexham. Maelor Gen. H.O. .. 48
Northern Ireland Hosps. Authority. P.-t. Cons. 35

PATHOLOGY

North East Met. R.H.B. Reg. .. 36
North West Met. R.H.B. Sr. H.M.O. 34
St. Andrew's, E.3. Reg. (Temp.) .. 36
Bath Clinical Area. Reg. 37
Chelmsford. St. John's. Locum Sr. Reg. 39
Doncaster Royal Infy. Reg. 41
Epping. St. Margaret's. Sr. H.O. .. 41
Leeds R.H.B. Sr. H.M.O. 34
Manchester Babies' & Children's H.M.C. Sr. H.O. 43
Reading. Royal Berkshire. H.O. .. 45
Romford. Oldchurch. Sr. H.O. .. 45
Scotland. North-Eastern R.H.B. Sr. H.O. 45
Southend-on-Sea Gen. Sr. H.O. .. 46
Truro. Royal Cornwall Infy. Sr. H.O. 47
Wolverhampton. Royal. Jr. H.M.O. .. 48

PSYCHIATRY

Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Jr. H.M.O. 37
Birmingham. St. Margaret's. Jr. H.M.O. 38
Birmingham R.H.B. Regs. 38
Coulsdon, Surrey. Cane Hill H.M.C. Reg. 40
East Anglian R.H.B. Sr. Reg. .. 41
Leeds R.H.B. Regs. 42
Leeds R.H.B. Sr. Reg. 42
Leeds R.H.B. Cons. & Sr. H.M.O.'s .. 34
Liverpool R.H.B. Sr. H.M.O. .. 42
Liverpool. Walton. Sr. H.O. 42
Manchester. R.H.B. Sr. H.M.O. .. 35
Scotland. Western R.H.B. Reg. .. 45
St. Albans. Shenley. Sr. H.O. .. 47
Sutton. Banstead. Jr. H.M.O. .. 47

RADIOLOGY

Birmingham United Hosps. Sr. Reg. 38
Coventry Group of Hosps. Sr. Reg. .. 40
Liverpool R.H.B. Sr. H.M.O. 34

RADIOTHERAPY

Marie Curie, N.W.3. H.O. 35
Sheffield R.H.B. Sr. H.O. or Reg. .. 46

SURGERY

London Jewish, E.1. H.O. 35
London Jewish, E.1. Sr. H.O. .. 35
Miller Gen., S.E.10. H.O. 35
North East Met. R.H.B. Regs. .. 36
Princess Beatrice, S.W.5. H.O. .. 36
St. Nicholas, S.E.18. H.O. 37
West London, W.6. H.O. 37
Aberystwyth Gen. H.O. 37
Ashford, Kent. H.O. 37
Ashford. Kent. Willesborough. H.O. 37
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Sr. H.O. 37
Barrow-in-Furness. North Lonsdale. Sr. H.O. & H.O. 38
Bedford Gen. H.O. 38
Bexhill-on-Sea. Sussex. H.O.'s .. 38
Birmingham Accident. H.O.'s .. 38
Birmingham R.H.B. Reg. 38
Bishop's Stortford. Haymeads. Reg. (Temp.) 38
Bolton District Gen. H.O. 39
Bradford. St. Luke's H.O.'s .. 39
Brechin. Stracathro. Pre-reg. H.O. .. 39
Canterbury. Kent & Canterbury. H.O. 39
Carmarthen. West Wales Gen. H.O. 40
Carshalton. St. Helier. Sr. Reg. .. 39
Chichester. Royal West Sussex. Sr. H.O. 40
Croydon Gen. Locum Reg. 40
Croydon. Mayday. Pre-reg. H.O. .. 40
Darlington Mem. Sr. H.O. & H.O. .. 40
Derby. City. Pre-reg. H.O. or Sr. H.O. 40
Doncaster Royal Infy. H.O. 41
Dorchester. Dorset County. Reg. .. 41
Dover. Royal Vic. H.O. 41
East Cumberland H.M.C. H.O. .. 41
Epping. St. Margaret's. H.O. .. 41
Hastings. Royal East Sussex. Pre-reg. H.O. 41
Haverfordwest. Pembroke County War Mem. H.O. 41
Hereford County. H.O. 41
Hounslow. Middx. H.O. 42
Hove Gen. H.O. 42
Hove Gen. Sr. H.O. 42
Huddersfield Royal Infy. H.O.'s .. 42
Hull Royal Infy. Sr. H.O. & H.O.'s .. 41
Hull. Victoria Hosp. for Sick Child. H.O.'s 41
Ipswich Borough Gen. Pre-reg. H.O. 42
Ipswich. East Suffolk & Ipswich. H.O. 42
Keighley & Dist. Vic. H.O. 42
Leeds R.H.B. Regs. 42
Lincoln County. Sr. H.O. 42
Liverpool United Hosps. Temp. H.O. 43
Liverpool. Walton. H.O.'s .. 43
Llanelly. Sr. H.O. 43
Louth. County Infy. Sr. H.O. & H.O. 43
Maidstone. West Kent Gen. Sr. H.O. 43
Manchester. Altrincham Gen. Sr. H.O 43
Manchester. West Manchester H.M.C. Sr. H.O. 44
Mansfield & Dist. Gen. Pre-reg. H.O. or Sr. H.O. 43
Newcastle United Hosps. Reg. .. 44
Newport, I.W. St. Mary's. Sr. H.O. & H.O. 44
Newton Abbot. S. Devon. H.O. .. 44
Northampton Gen. H.O.'s 44
North Shields. Tynemouth Vic. Jubilee Infy. H.O. 44
Nottingham Gen. H.O. 44
Nuneaton. Manor. H.O. 44
Penzance. West Cornwall. Sr. H.O. .. 44
Plymouth. South Devon & East Cornwall. Sr. H.O.'s & H.O.'s .. 45
Pontypool & Dist. Jr. H.M.O. .. 44
Ramsgate Gen. Sr. H.O. 45
Redhill County. H.O. 45
Redruth. Camborne-Redruth. Sr. H.O. 45
Rhymney & Sirhowy Valleys H.M.C. Sr. H.O. & H.O.'s 45
Salisbury Gen. H.O. 46
Shrewsbury. Royal Salop Infy. H.O. 46
Slough. Upton. H.O. 46
South East Met. R.H.B. Reg. .. 46
Southend Gen. H.O. 46
Stockport. Stepping Hill. Sr. H.O. 46
Wakefield. Clayton. Sr. H.O. .. 48
Wakefield. Gen. Sr. H.O. 48
Wakefield. Pinderfields Gen. Locum Sr. H.O. 48
Warrington Gen. H.O. 48
Warrington Infy. H.O. 48
Welsh R.H.B. Regs. 48
Workington Infy. H.O. or Sr. H.O. .. 49
Worthing. Sr. H.O. 48
Wrexham. War Mem. H.O. 48
Yorkshire. East Riding H.M.C. H.O.'s 48

UROLOGY

South East Met. R.H.B. Reg. .. 45

VENEREOLOGY

St. Mary's, W.2. P.-t. Reg. 37

PUBLIC APPOINTMENTS 49

GENERAL PRACTICE 50

MISCELLANEOUS 50

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

FACULTY OF ANÆSTHETISTS
ROYAL COLLEGE OF SURGEONS OF ENGLAND

ANÆSTHETICS

The following Courses have been arranged to take place at the College this Autumn.

A 2-week Course of 16 Lectures in Pharmacology will be held from 19TH to 31ST OCTOBER, 1953.

Fee £6 6s., or 10s. each for single lectures.

A 3-week Course in Anæsthetics of 40 lectures, plus clinical work in medicine and tutorials, will be held from 12TH to 30TH OCTOBER, 1953.

Fee £34 13s. for the full Course, £15 15s. each for lectures and tutorials, £3 3s. for clinical conferences, or 10s. per lecture.

Similar Courses will be arranged in the Spring of 1954.

Further details and application forms may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (telephone : HOLborn 3474).

UNIVERSITY OF LONDON
BRITISH POSTGRADUATE MEDICAL FEDERATION
INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY

A COURSE OF 10 LECTURES on the subject The Paralyses of Cerebral Origin in Early Life, will be given in the lecture-theatre at the National Hospital, Queen-square, London, W.C.1, on THURSDAYS at 5.30 P.M.

8th Oct.	Introductory : Terminology, Diagnosis, Classification and Physiological Considerations	Dr. J. PURDON MARTIN
15th Oct.	Ætiological Factors of "Congenital" Group (Kernicterus, Birth Trauma, Anoxia, Developmental Abnormality)	Dr. A. P. NORMAN
22nd Oct.	Ætiological Factors of "Acquired" Group (Virus Infections, Lipoidosis, Vascular, Degenerative Diseases)	Sir RUSSELL BRAIN
29th Oct.	Cerebral Diplegia : Clinical Types, Diagnosis and Treatment	Dr. PAUL SANDIFER
5th Nov.	Hemiplegia : Clinical Types, Diagnosis and Treatment	Dr. E. A. CARMICHAEL
12th Nov.	Syndromes involving the Basal Ganglia : Clinical Types, Diagnosis and Treatment	Dr. HELEN DIMSDALE
19th Nov.	Speech Defects in Paralytic Syndromes	Dr. MACDONALD CRITCHLEY
26th Nov.	Sensory Defects in Paralytic Syndromes	Dr. M. KREMER
3rd Dec.	Mental Deficiency and Paralytic Syndromes	Dr. L. T. HILLIARD
10th Dec.	Epilepsy and Paralytic Syndromes	Dr. B. H. KIRMAN

The fee for attending the course will be 2 guineas.

Tickets may be obtained on application to the Dean, Institute of Neurology (Queen-square), The National Hospital, Queen-square, London, W.C.1.

THE LONDON HOSPITAL MEDICAL COLLEGE

COURSE IN ADVANCED MEDICINE

A Postgraduate Course in Medicine will be held at the London Hospital commencing MONDAY, 11TH JANUARY, and finishing FRIDAY, 19TH MARCH, 1954. Classes will be held on Mondays, Wednesdays, and Fridays. The Course will be limited to 24 students.

Applications should be made to the Dean. The fee for the whole course will be 35 guineas, and for Old Londoners 15 guineas.

H. B. MAY, M.A., M.D., M.R.C.P., Dean.

Turner-street, London, E.1.

ELECTRO-ENCEPHALOGRAPHY

A COURSE for postgraduates in the technique and clinical application of electro-encephalography will be held jointly at the Institutes of Psychiatry and Neurology from 5TH OCTOBER to 12TH DECEMBER, 1953.

For further particulars apply to the Dean, Institute of Psychiatry, Maudsley Hospital, Denmark-hill, S.E.5, or the Dean, Institute of Neurology (Queen-square), The National Hospital, Queen-square, W.C.1.

INSTITUTE OF ACCIDENT SURGERY

The next full COURSE ON TRAUMATIC SURGERY will be held during the week of MONDAY, 7TH DECEMBER–FRIDAY, 11TH DECEMBER, 1953.

Further particulars can be obtained from the Secretary of the Institute, Birmingham Accident Hospital, Bath-row, Birmingham, 15.

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE CERTIFICATE, AND THE DIPLOMA, IN PUBLIC HEALTH, AND THE DIPLOMA IN INDUSTRIAL HEALTH

The next bi-annual Course of Instruction for the Certificate in Public Health (C.P.H.) will commence on 2ND OCTOBER, 1953. This leads to Courses both for the Diploma in Public Health and for the Diploma in Industrial Health. All Courses may be taken either whole time or part time.

Prospectuses, enrolment forms and full details may be obtained from the Secretary, 28, Portland-place, London, W.1. (Telephone : LANgham 2731/2.)

TUBERCULOSIS EDUCATIONAL INSTITUTE
GODALMING, SURREY

A 3-day CLINICAL COURSE will be held at King George V Hospital for Diseases of the Chest, Godalming, on 30th September, 1st and 2nd October, 1953. Fee £3 3s.

Applications for further information and for enrolment should be addressed to the Secretary, Tuberculosis Educational Institute, Tavistock House North, Tavistock-square, London, W.C.1.

COURSE IN POLIOMYELITIS
at the
INSTITUTE OF ORTHOPÆDICS
5TH–10TH OCTOBER, 1953

5th October Town Section	Public Health aspects	Dr. C. H. LACK
	Laboratory aspects	Dr. F. SANDERS
	The Pathological Anatomy of Poliomyelitis and its bearing on clinical features, including prognosis and recovery	Dr. H. A. SISSONS and Mr. W. J. SHARRARD
6th October Country Section	Treatment in convalescent phase : muscle charts : electrical examination	Mr. D. M. BROOKS and Miss PRIOR
	Respiratory and bulbar paralysis	Dr. A. B. KINNIER WILSON and Dr. F. H. STEVENSON
7th October Country Section, A.M.	Reconstructive surgery	Mr. J. A. CHOLMELEY
Garston Manor, P.M.	Rehabilitation	Group Captain C. J. S. O'MALLEY, C.B.E.
8th October Town Section	Some neurological problems of diagnosis	Dr. P. H. SANDIFER
	Vascular phenomena	Mr. G. L. W. BONNEY
9th October Country Section	Resettlement	Mr. D. M. BROOKS
	Appliances : prescription	Mr. H. J. SEDDON
	Appliances : construction	Mr. W. TUCK

The fee for this course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean, at 234, Great Portland-street, W.1.

TANCRED'S STUDENTSHIPS
DIVINITY : MEDICINE : LAW
£100 p.a. each. For Men only.

The Governors propose to elect 1 Student in Divinity at Christ's College, Cambridge, on the result of the Scholarship Examinations to be conducted in DECEMBER, 1953, by the Queens', Christ's, St. John's, Emmanuel and Sidney Sussex Group of Colleges in the University of Cambridge. Candidates must have been born in England, Scotland or Wales and be members of the Church of England and unmarried ; they must also be within the ages of 17 and 22 years. Candidates should in addition to making the necessary arrangements with the Managers of the above Scholarship examinations send in a Petition to the Clerk to the Tancred Foundation by the 1st November, 1953. The Foundation also awards Studentships in Physic and Law, further details of which will be published in this paper at a later date.

Apply for further particulars and Form of Petition stating kind of Studentship and mentioning this paper to the Clerk, R. M. C. HOWARD, Esq., D.S.O., 28, Lincoln's Inn-fields, London, W.C.2.

UNITED MANCHESTER HOSPITALS
MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13

CLINICAL RESEARCH FELLOWSHIP

Applications are invited from medically qualified persons for a Full-time Clinical Research Fellowship for work on the clinical and laboratory aspects of Hæmophilia. The research will be carried out in the University Department of Hæmatology at Manchester Royal Infirmary under the supervision of the Director, Dr. John F. Wilkinson, and the ward, outpatient, and laboratory facilities of the Department will be available to the Fellow. The stipend will be £800–£1000 p.a., according to age and experience, and the appointment will be for 1 year in the first instance and may be renewable annually up to 5 years.

Applications should give details of previous training and experience, though these need not be in the special field of blood diseases. The names of 2 referees should be given. Applications should be addressed to the undersigned to reach him not later than the end of September, 1953.

F. J. CABLE, Secretary to the Board of Governors.

1st September, 1953.

BRITISH EMPIRE CANCER CAMPAIGN invites applications from British subjects for EXCHANGE FELLOWSHIPS IN CANCER RESEARCH offered by the National Cancer Institute of Canada. Fellowships are of 1 years tenure at a stipend of $4000. Travelling expenses to and from centre of work will be borne by the Campaign.

For further particulars and application forms, apply to the Secretary-General, British Empire Cancer Campaign, 11, Grosvenor-crescent, Hyde Park Corner, London, S.W.1. Completed applications must be received by 15th November, 1953.

UNIVERSITY OF OTAGO, Dunedin, New Zealand. The University proposes to appoint a LECTURER IN PHYSIOLOGY. Salary range for medically qualified £960–£50–£1060 p.a., otherwise £800–£50–£950 p.a.

Further particulars and information as to the method of application are available from the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1. Applications close in New Zealand and London on 30th November, 1953.

THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY (University of London), 330/332, Gray's Inn-road, W.C.1. FIRST ASSISTANT to the Professorial Unit (Senior Registrar status). Applications are invited for this post with effect from 1st November, 1953. A higher qualification in surgery is required and candidates must have held an otolaryngological registrarship in a teaching hospital. The post is a full-time one tenable for an initial period of 1 year, subject to annual re-election thereafter. Salary commencing at the rate of £1100 p.a. with superannuation benefits and 2 annual increments of £100 in the event of reappointment.

Applications in triplicate, giving full particulars of age, qualifications and experience, and accompanied by the names of 2 referees, should be sent to the Secretary not later than 8th October.

THE UNIVERSITY OF LEEDS. Department of Pathology. Applications are invited from qualified medical practitioners with experience in neuropathology, or from those who have wide experience in pathology and wish to develop a special interest in neuropathology, for a post of NEUROPATHOLOGIST with the status of either Senior Lecturer or Lecturer on the salary scale £1600–£100–£2000 for a Senior Lecturer and £100–£1000–£1500 for a Lecturer.

Applications (12 copies) stating age, qualifications and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 12th October, 1953.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ASSISTANT PATHOLOGIST (whole-time) required, with extensive experience in hæmatology, at the North Western Group Laboratory, 4/8, Pond-street, Hampstead, N.W.3. Salary scale £1300 (at age 32)–£1750. Laboratory may be visited by direct appointment.

Detailed application, including date of birth and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 17th October, 1953.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ASSISTANT CHEST PHYSICIAN, whole-time, required at Harrow Chest Clinic, 199, Station-road, Harrow, Middlesex. Salary scale £1300 (at age 32)–£1750. Higher medical qualification desirable. Candidates should have good general medicine experience and special experience in tuberculosis and diseases of the chest. The successful applicant will work under the general supervision of the consultant physician in charge and duties will include the care of 10 Beds at Hendon Isolation Hospital, Hendon, N.W.4, and 28 Beds at Edgware General Hospital, Edgware, for the treatment of tuberculous patients. Clinic may be visited by direct appointment.

Detailed application, including date of birth and 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland Place, W.1, by 23rd October, 1953.

CHELMSFORD. BROOMFIELD HOSPITAL. Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER wanted at once for above Hospital. Must have experience in pulmonary tuberculosis.

Apply Physician-Superintendent. Telephone: Broomfield 323.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of Whole-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale), Dewsbury, Batley, and Mirfield group. The person appointed to reside in, or near, Dewsbury.

Applications (2 copies) stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications from suitably qualified practitioners for the whole-time, non-resident post of ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer scale) for duties at hospitals in the Halifax group. The successful candidate will work under the general guidance of the Consultant in charge of the department and will be required to reside in Halifax or within such distance of that town as the Board may approve.

Applications (10 copies) stating age, qualifications and details of present and previous appointments, with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of Part-time CONSULTANT in Otolaryngology (8 sessions per week) for duties at hospitals in the Hull, East Riding, and Goole areas. The person appointed will be regarded as a junior member of the team of E.N.T. Consultants in the area and will be required to reside in or near Hull.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the whole-time appointment of ASSISTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT (Senior Hospital Medical Officer scale) at the Meanwood Park Hospital, Leeds. The successful candidate may, subject to the direction of the Medical Superintendent, be required to visit other hospitals in the region in connection with the Mental Deficiency Service. Residential accommodation for a married couple will be available at the Hospital, for which the necessary deductions from salary will be made. Consideration will be given to applicants who wish to be non-resident.

Applications (10 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of Whole-time SENIOR HOSPITAL DENTAL OFFICER for duties at St. James's Hospital, Leeds.

Applications (10 copies), stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the whole-time appointment of ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale) for duties at the Stanley Royd Hospital, Wakefield (2000 Beds) and associated clinics at Wakefield, Dewsbury, and Pontefract General Hospitals. Accommodation is available for a single person.

Applications (10 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer scale). The person appointed will be responsible for the day-to-day supervision of cases at the Gateforth Sanatorium, near Selby, and also undertake duties at Chest Clinics in the Goole, Pontefract, and Selby areas under the direct control of the Chest Consultant in the area. The duties will include preventive, care, and aftercare work on behalf of the Local Health Authority.

Applications (15 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer scale), for duties at Chest Clinics, Hospitals, and Sanatoria in the Hull area. The post will involve periods of duty with the Mass-radiography Unit, which is an integral part of the chest service. Adequate experience in pulmonary tuberculosis and chest radiology is essential, and the successful candidate will be required to work under the direct supervision of the Senior Chest Physician at the Hull centre. The person appointed will be required to reside in or near Hull.

Applications (15 copies), stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the appointment of Whole-time CONSULTANT IN PSYCHIATRY for the mental deficiency hospitals and associated hostels in the Hull and East Riding areas. Applicants should have had special experience of mental deficiency. The person appointed will be required to undertake the duties of Medical Superintendent of Tilworth Grange (150 Beds), Sutton, near Hull; Winestead Colony (130 Beds), near Patrington, and Keyingham Hostel (30 Beds); and will be Visiting Consultant at Brandesburton Hall and Cherry Burton Hostel, near Beverley. (The duties attached to the post may be altered at a future date to include the appointment of Medical Superintendent at Brandesburton Hall and Cherry Burton Hostel.) The Consultant will be required to act as Medical Arbiter for the Hull and East Riding Mental Deficiency Sub-regional Admission Bureau and may also be required to advise the Local Health Authorities on clinical aspects of mental deficiency problems. The successful candidate will be required to reside in the Hull area.

Applications (15 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, not later than 17th October, 1953.

LIVERPOOL REGIONAL HOSPITAL BOARD. Aintree AND WALTON HOSPITALS. Applications are invited for the whole-time post of ASSISTANT RADIOLOGIST with duties at the above hospitals. Salary £1300 (at age 32)–£50–£1750 p.a. Applicants should possess a Diploma in Radiology and have had wide experience in radiology.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th October, 1953.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. South AND CENTRAL LIVERPOOL AREAS. Applications are invited for the post of Whole-time ASSISTANT CHEST PHYSICIAN. Salary £1300 (at age 32)–£50–£1750 p.a. Duties will include work at the chest clinics in the area covered by the Consultant Chest Physician and such duties as may be required at the Sefton General Hospital (35 tuberculosis beds). Candidates should hold a higher degree or diploma and should have had extensive experience in the diagnosis and treatment of diseases of the chest including tuberculosis.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th October, 1953.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. Ormskirk AND SOUTHPORT. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST. Applicants should possess the D.P.M. and have had reasonable experience in psychiatry and modern treatments. Salary £1300 (at age 32)–£50–£1750 p.a. Duties will be mainly at Ormskirk Mental Hospital but will also entail outpatient work in the Ormskirk and Southport areas.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th October, 1953.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time, non-resident post of ASSISTANT ANÆSTHETIST to work under the general guidance of the Group Consultant at the Ashton, Hyde, and Glossop Hospitals, near Manchester. Salary £1300–£50–£1750. The successful candidate will be required to live in or near Ashton.

Application forms from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, to be returned not later than 28th September, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time resident post of ASSISTANT PSYCHIATRIST at Whittingham Hospital (about 3000 Beds), Preston. Married or single accommodation available. Candidates should have had considerable experience in psychiatry and possess the D.P.M. Salary £1300–£50–£1750 p.a.

Application forms from the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, to be returned by 5th October, 1953.

NEWCASTLE REGIONAL HOSPITAL BOARD. Poole HOSPITAL, MIDDLESBROUGH. (318 Beds; including approximately 80 thoracic surgical beds.) Applications are invited for the appointment of ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer status), whole-time. The appointment offers opportunity for experience in all forms of treatment of pulmonary tuberculosis and the hospital is the main centre for major chest surgery in this region. Applications will be considered from candidates with special tuberculosis experience and also from candidates with wide experience in general medicine including senior registrar status and possessing higher medical qualifications though without special experience in chest diseases, who wish to gain special experience in tuberculosis with a view to a senior appointment for the chest service.

Applications, together with names and addresses of referees (preferably) or testimonials to a total of 3 to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT ANÆSTHETIST required to undertake duties at the City General Hospital, Sheffield, and the Beckett and St. Helen Hospitals, Barnsley.

Application forms obtainable from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, to be returned by 10th October, 1953.

SHEFFIELD REGIONAL HOSPITAL BOARD. Resident or non-resident Locum ANÆSTHETIST required for the Barnsley Hospitals and the Montagu Hospital, Mexborough. Single accommodation is available at the Beckett Hospital, Barnsley (emoluments £150 p.a.). Remuneration will be 31½ guineas per week. Possession of a car is desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment as Part-time CONSULTANT ANÆSTHETIST for duties in the Tunbridge Wells group of hospitals mainly concerned with the Plastic Surgery and Jaw Injuries Centre at East Grinstead. A total of 9 notional half-days is required and either one appointment, or more on a sessional basis may be made. Candidates must have had wide experience in anæsthetics and hold the Diploma in Anæsthetics. Applicants may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 3rd October, 1953.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Locum ANÆSTHETIST (9 half-days per week) for the Isle of Wight Group 16th–30th October, 1953. Remuneration 45 guineas per week (if holding National Health Service Consultant grading) or 31½ guineas per week.

Apply immediately to Dr. J. REVANS,
Beeston House, Water Lane, Winchester.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT ANÆSTHETIST to serve the Rhymney and Sirhowy Valleys Hospital Management Committee. The successful candidate, who will work mainly at the Caerphilly District Miners' Hospital, will be required to reside within the area, and will also be expected to serve other hospitals in this and neighbouring groups. Candidates must be in possession of the D.A. and have had wide experience in the specialty. The successful candidate will be asked to state whether he wishes to hold a whole-time or maximum part-time appointment.

Applications (12 copies), stating date of birth, giving details of qualifications, experience, previous appointments, with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a post as CONSULTANT PÆDIATRICIAN at hospitals managed by the South Belfast Hospital Management Committee, with occasional duties at other hospitals in or near Belfast. The post will be on a part-time basis of 7 half-days of duty weekly. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and will be received not later than 3rd October, 1953.

Hospital Services : Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Female medical practitioners for the resident post of OBSTETRIC HOUSE SURGEON at the above Hospital. This post is vacant in October, and is recognised for the D.Obst.R.C.O.G.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, should be sent to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, not later than 26th September, 1953.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident). House Officer or Senior House Officer grade, according to experience.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary (L).

BRITISH HOSPITAL FOR MOTHERS AND BABIES, Samuel-street, Woolwich, S.E.18. SENIOR HOUSE OFFICER (obstetrics). Vacant 1st November. Recognised for M.R.C.O.G. 6 months appointment, and may be renewed for a further period. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

EAST END MATERNITY HOSPITAL, 384/398, Commercial-road, London, E.1. (60 Beds.) RESIDENT OBSTETRICAL OFFICER required (post recognised for M.R.C.O.G.). 6 months House Officer (third) and, subject to satisfactory service, 6 months Senior House Officer. Whitley Council salaries, deduction for emoluments £100 and £156 respectively. Post vacant 2nd November, 1953.

Applications to Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

HACKNEY HOSPITAL, E.9. (811 Beds.) Applications are invited for second or third post of CASUALTY HOUSE OFFICER, to act also as House Physician to the Skin Department. 6 months appointment.

Applications, with 3 testimonials, to the Secretary, Hospital Management Committee, Hackney Hospital, E.9.

KING EDWARD MEMORIAL HOSPITAL, Ealing, W.13. SOUTH WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident), to Orthopædic, Casualty, and Fracture Departments. Recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, dates and details of experience, together with copies of 2 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex. Closing date 29th September, 1953.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the position of RESIDENT HOUSE PHYSICIAN. The appointment is for 6 months commencing on 15th October, 1953.

Forms of application to be obtained from the Physician-Superintendent at the Hospital.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for 1 of 2 posts of CASUALTY OFFICER (Senior House Officer grade). The appointment, which is vacant immediately, is tenable for 1 year and has been recognised for 6 months training for final F.R.C.S. examinations under the revised regulations operative from January, 1954.

Applications, stating age, qualifications and experience, with copies of recent testimonials or names of referees, should be addressed to the Secretary, Group Offices, Lewisham Hospital, London, S.E.13.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR in General Medicine. A higher qualification, although desirable, is not essential.

Applications (12 copies), giving the names and addresses of 3 referees, should reach the House Governor not later than 3rd October, 1953. H. BRIERLEY, House Governor.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) Applications invited for the post of RESIDENT SENIOR HOUSE OFFICER (Surgical Department), vacant 1st October, 1953. Salary £670 p.a. is subject to deduction at rate of £156 p.a. for board, lodging, &c.

Applications with copies of testimonials, to the Secretary at the Hospital.

LONDON JEWISH HOSPITAL, Stepney-green, E.1. Applications invited for the post of RESIDENT HOUSE SURGEON, vacant October, 1953. Tenable for 6 months, renewable. Salary £350, £400, or £450 p.a., according to experience, subject to deduction at the rate of £100 for board, lodging, &c.

Applications, with copies of testimonials, to the Secretary at the Hospital.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. Applications are invited from registered medical practitioners for the post of GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), vacant immediately.

Applications, with copies of testimonials, to the Medical Director.

MEMORIAL HOSPITAL, Woolwich, S.E.18. Senior HOUSE OFFICER (Casualty Department), recognised for F.R.C.S. Vacant 10th October. 6 months appointment and may be renewed for a further period. Salary £670 p.a., less £150 for residence.

Apply to Secretary.

MILLER GENERAL HOSPITAL. (180 Beds.) Recognised for F.R.C.S. examination. HOUSE SURGEON, vacant approximately 31st October, 1953. 6 months appointment. National salary and conditions.

Applications and testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, St. Alfege's Hospital, Greenwich, S.E.10.

MILLER GENERAL HOSPITAL. (180 Beds.) House PHYSICIAN, vacant approximately 4th November, 1953. 6 months appointment. National salary and conditions.

Applications and testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, St. Alfege's Hospital, Greenwich, S.E.10.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in Anæsthetics for a period of 12 months from 1st October. The post offers experience in general surgical anæsthesia within the Group; facilities provided for study for higher examinations.

Applications to Secretary, Hospital Management Committee, Hackney Hospital, London, E.9, by 25th September, quoting reference MH/SHO.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1. (With which is associated the Institute of Cardiology.) SENIOR REGISTRAR. A vacancy for this post will occur as from 1st November, 1953. Applicants should have held a Senior Registrar appointment in General Medicine and should possess a higher medical qualification. Opportunities for research are available.

Applications, with copies of 3 recent testimonials, should be sent to me not later than Friday, 25th September, 1953.

ROBERT G. E. WHITNEY, Secretary to the Board.

NEASDEN HOSPITAL, Brentfield-road, N.W.10. Locum RESIDENT MEDICAL OFFICER required (acute infectious diseases) for 1 or both of the periods: 28th September–2nd October; 12th October–23rd October, inclusive. Registrar grade. Whole-time duties.

Applications, with copies of 2 testimonials, immediately to Physician-Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) REGISTRAR in Pathology (non-resident), Group Laboratory, Mile End Hospital, Bancroft-road, E.1.

(2) REGISTRAR in Surgery, Mile End Hospital, Bancroft-road, E.1. Resident or non-resident, sleeping-in on duty nights.

(3) REGISTRAR in General Surgery (resident or non-resident) General Hospital, Rochford, Essex. Duties principally at the General Hospital, Rochford (a large acute hospital of 603 Beds) and certain other duties at other hospitals in the group. Married furnished or unfurnished accommodation available.

(4) REGISTRAR in Pulmonary Tuberculosis (resident), Black Notley Hospital, near Braintree, Essex.

(5) REGISTRAR in Obstetrics (resident), the Mothers' Hospital (Salvation Army), London, E.5. Post recognised for M.R.C.O.G.

(6) REGISTRAR in Obstetrics and Gynæcology (resident), Bethnal Green Hospital, Cambridge Heath road, E.2.

(7) REGISTRAR in Anæsthetics (non-resident), General Hospital, Southend-on-Sea.

Appointments subject to review after 1 year.

Separate applications in duplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary, with 2 copies of 2 recent testimonials to Secretary, 11A, Portland-place, W.1, by 3rd October, 1953.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (resident) required for 1st November, 1953, for 6 months. Recognised for second-post pre-registration students, but registered medical practitioners may apply. Candidates must have held house appointment in either medicine or surgery. Large Obstetric and Gynæcological Department. Recognised by the R.C.O.G. for Diploma, and as a combined post for Membership.

Applications, stating age, qualifications, experience, nationality, with copies of recent testimonials, to Secretary of Hospital, by 28th September.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE PHYSICIAN (second post). Pre-registration post, vacant 1st November, 1953. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than 26th September, 1953.

PLAISTOW HOSPITAL, Samson-street, London, E.13. (179 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (second or third post) for 6 months commencing soon as possible in the Chest Unit and Infectious Diseases Unit. Recognised pre-registration second post. The position offers valuable experience in both groups of diseases and is particularly useful to candidates sitting for the M.R.C.P. examination.

Applications, with copies of recent testimonials, should be sent to M. J. HUNTLEY, Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 30th September, 1953.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. RESIDENT HOUSE OFFICER for Casualty and Anæsthetic duties. Vacant now for period of 6 months. Registered practitioners.

Applications, with all particulars, and copies of 2 testimonials, to House Governor.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. RESIDENT HOUSE SURGEON (general surgery, obstetrics and gynæcology), for period of 6 months, vacant now. Registered practitioners only.

Applications, with full details, and copies of 2 testimonials, to House Governor.

QUEEN MARY'S (Roehampton) HOSPITAL, London, S.W.15. (501 Beds.) A vacancy for a SENIOR HOUSE OFFICER (medical) will arise shortly. National Health Service salary and conditions of service are applicable. A charge of £130 p.a. will be made for residential emoluments.

Application forms will be provided on request to Hospital Management Branch, Ministry of Health, Norcross, Blackpool, Lancs.

ROYAL EYE HOSPITAL, S.E.1. King's College Hospital GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER from 1st October, 1953.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's-circus, S.E.1.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1.

SENIOR REGISTRAR. There will be a vacancy for a Senior Registrar on 1st January, 1954. The appointment will be for an initial period of 1 year and otherwise in accordance with the terms and conditions of service in the National Health Service. Applicants must have had considerable experience in general surgery and in this specialty and hold a higher surgical qualification. Experience in teaching and in methods of research will be taken into consideration.

REGISTRAR. Applications are invited for a post of Registrar as from 1st November, 1953. The appointment will be for an initial period of 1 year and otherwise in accordance with the terms and conditions of service in the National Health Service. Applicants should have had considerable clinical experience in general surgery and in this specialty and they should hold a higher surgical qualification.

Applications for either post should give full information as to qualifications and experience, with the names of 2 referees, and should be sent to the House Governor before 3rd October, 1953.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, London, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON. There will be a vacancy (second or subsequent post) on 1st October, 1953. Appointment for 6 months, with salary as laid down for House Officer grades in the terms and conditions of service under the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor by 24th September, 1953.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (ophthalmology, E.N.T., and radiotherapy). Salary £670 p.a., less £130 for residential emoluments.

Applications, stating qualifications, and experience, with copies of 3 recent testimonials, to be sent to the Hospital Secretary by 26th September, 1953.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the Orthopædic and Fracture Department of the above Hospital. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 30th September, 1953.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SENIOR CASUALTY OFFICER (Registrar grade) required at the above Hospital. Experience in practical operative surgery an advantage. Recognised post for the F.R.C.S. The Registrar appointed would be expected to deputise for the Resident Surgical Officer. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 30th September, 1953.

ST. ANDREW'S HOSPITAL, Devons-road, Bow, E.3. BOW GROUP HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (temporary) required in the Pathological Laboratory of above Hospital. Candidates should have at least 1 year's pathological experience.

Apply to the Group Secretary, 2A, Bow-road, E.3.

ST. JAMES' HOSPITAL, Ouseley-road, Balham, S.W.12. SENIOR HOUSE OFFICER (Medical Department). Post vacant 1st October.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, 14, Atkins-road, Balham, S.W.12, by 26th September.

ST. JAMES' HOSPITAL, Ouseley-road, Balham, S.W.12. SENIOR HOUSE OFFICER (orthopædics and trauma). Recognised for F.R.C.S. Post vacant 1st October.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, 14, Atkins-road, Balham, S.W.12, by 26th September.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of CASUALTY PHYSICIAN. Candidates must have held an appointment as House Physician at this Hospital, or at another General Hospital approved by the Board of Governors. The appointment is for a first period of 6 months, as from 1st December, 1953, with remuneration at the rate of £670 p.a., i.e., graded "Senior House Officer."

Applications, stating nationality, date of birth, permanent address, qualifications, with dates and details of previous appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, within 10 days of the appearance of this advertisement.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Temporary REGISTRAR to the Department for Diseases of the Skin (graded "Senior Registrar"). Candidates must be registered medical practitioners. Preference will be given to Members of the Royal College of Physicians. The appointment is for a period to the 30th September, 1954, and the successful candidate will be required to take up his duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications, and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, within 10 days of the appearance of this advertisement.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time REGISTRAR to the Venereal Diseases Department (graded "Registrar"). Preference will be given to candidates having some experience of this specialty, and the successful candidate will be required to undertake 6 notional half-days per week from a date to be arranged.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, within 10 days of the appearance of this advertisement.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Upper-road, Plaistow, London, E.13. RESIDENT CASUALTY OFFICER/DEPUTY RESIDENT SURGICAL OFFICER (Senior House Officer grade) required for 1 year commencing 7th October, 1953.

Applications, with copies of recent testimonials, to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, by 26th September, 1953.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. HOUSE SURGEON. Recognised for F.R.C.S. Vacant 1st November. Approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. STEPHEN'S HOSPITAL, Fulham-road, Chelsea, S.W.10. HOUSE PHYSICIAN (resident). General medicine and some tuberculosis. Vacancy 13th October, 1953.

Applications, naming 2 referees, to Medical Superintendent immediately.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. Applications are invited for the post of MEDICAL REGISTRAR to the Thoracic Unit. The appointment is whole-time, non-resident and is graded as that of a Senior Registrar.

Full particulars and form of application, which must be returned not later than Monday, 5th October, 1953, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. HOUSE SURGEON (general and genito-urinary) required 1st November.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials to Secretary by 28th September.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for the post of SENIOR HOUSE OFFICER to Department of Anæsthetics for 1 year from 1st December. Candidates should have held 2 house appointments.

Applications (9 copies), with names of 2 referees, to House Governor by 2nd October.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (whole-time), non-resident, required at above Hospital. Vacant 27th November, 1953. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 17th October, 1953.

ABERYSTWYTH GENERAL HOSPITAL, Aberystwyth. (81 Beds.) MID WALES HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duties 1st November, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with 3 recent testimonials, to be addressed to— J. PRICE THOMAS,
Secretary to the Management Committee.

The General Hospital, Aberystwyth.

ACCRINGTON. VICTORIA HOSPITAL. (112 acute beds.) SENIOR HOUSE OFFICER (medicine) required on or about 1st October, 1953.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (anæsthetics), Male. Large General Hospital, recognised for D.A. 6 months appointment, vacant early November. National Health Service salary and conditions of service.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD (near), KENT. WILLESBOROUGH HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital. Good experience in general surgery with some casualty work. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be forwarded to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD (near), KENT. WILLESBOROUGH HOSPITAL. Applications are invited for the appointment of HOUSE PHYSICIAN at the above Hospital. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD, KENT. GROSVENOR SANATORIUM. (260 Beds.) RESIDENT MEDICAL OFFICER. This privately owned Sanatorium is fully equipped for the treatment of pulmonary tuberculosis. Good residential accommodation is provided, and the Sanatorium is 1¼ miles from the centre of Ashford, whence there is an excellent train service to London. Salary £650–£900 p.a., according to experience. The post will be vacant on 1st December.

Application to Dr. B. ROBERTS, Medical Superintendent.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of RESIDENT HOUSE SURGEON at the above Hospital. Salary £350, £400, or £450 a year, according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Royal Buckinghamshire Hospital

SENIOR HOUSE OFFICER to Accident and Orthopædic Department (which is centred upon this Hospital and comprises 48 Beds), vacant now.

Applications for the above appointment, with 2 testimonials, to Secretary-Superintendent as soon as possible.

Stoke Mandeville Hospital, Aylesbury

HOUSE OFFICER (resident) in General Medicine, vacant 6th October.

HOUSE OFFICER (resident) in Pædiatrics, vacant 13th October.

Both posts are recognised for Pre-registration Service, but registered practitioners are invited to apply.

Applications with 2 testimonials to the Administrative Officer as soon as possible.

Tindal General Hospital

RESIDENT SURGICAL OFFICER (Senior House Officer), vacant 12th October, 1953. The Surgical Unit consists of 100 Beds and undertakes all the general surgery for the area. The post offers excellent training in practical surgery, and is eminently suitable for an F.R.C.S. Final candidate. Salary £670 p.a., less £140 p.a. for board-residence. Further details on request.

Please apply, with 2 testimonials, to the Administrative Officer, by 20th September, 1953.

HOUSE SURGEON (E.N.T.), Male or Female, vacant now. New department with high turnover and 4 Outpatient Clinics weekly. No casualty department. Recognised for F.R.C.S. and D.L.O.

HOUSE PHYSICIAN (Chest Unit), second or third post, Male or Female, vacant now. Duties include care of about 20 chest cases (including T.B. Chalets), which may increase in due course, and 4 outpatient clinics weekly, including refills, forming a progressive chest unit for the Aylesbury area. Instruction in bronchoscopy and bronchography given. An acute Geriatric Unit, a small long-stay Annexe, and a medical Outpatient Clinic provide some general medicine. No casualty department. Applications for a locum appointment will be considered.

Both posts are recognised for Pre-registration Service, but registered practitioners are invited to apply.

Applications, with 2 testimonials, to the Administrative Officer as soon as possible.

St. John's Hospital, Stone, near Aylesbury

JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary of £700–£50–£1000 p.a., less a charge of £140 p.a. for board, lodging, and laundry if resident.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, to the Physician-Superintendent within 2 weeks of the appearance of this advertisement.

BARNSLEY. BECKETT HOSPITAL. Sheffield Regional HOSPITAL BOARD. Whole-time RESIDENT CASUALTY REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BATH CLINICAL AREA. The Board of Governors of the UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Pathology. The appointment will be held for 1 year in the first instance, and be renewable for a further year. The successful candidate will be required to work for the first year in the Bath group of hospitals.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd October, 1953.

BATH CLINICAL AREA. The Board of Governors of THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Obstetrics and Gynæcology. Applicants should have had previous experience in obstetrics and gynæcology. The appointment will be held for 1 year in the first instance, and be renewable for a further year. The successful candidate will be required to work for the first year in the Bath Group of Hospitals.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd October, 1953.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. ROSSENDALE GENERAL HOSPITAL. SENIOR HOUSE OFFICER (obstetrics) for Obstetric/Gynæcological Unit consisting of 25 obstetric and 8 gynæcological beds.

Applications to H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Walmersley-road, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medical), Rossendale General Hospital.

Applications, giving names of 2 referees, should be made to—
H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Bury, Lancs.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for resident posts of SENIOR HOUSE SURGEON and HOUSE SURGEON (recognised for pre-registration) at the above Hospital, with surgical work under control of Consultant Surgeons. Posts recognised for F.R.C.S. National conditions and salary scales.

Applications to the Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. 2 SENIOR HOUSE OFFICERS in Anæsthetics (resident) required. Centred at Dudley Road Hospital (900 Beds) but will include duties and a period of residence at other hospitals in the Group. Appointments recognised for training for Diploma in Anæsthetics and F.F.A. Duties include list and emergency work in general surgery, gynæcology, obstetrics, and E.N.T.

Applications, with copies of 2 recent testimonials, to the Secretary, Hospital Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM ACCIDENT HOSPITAL (215 Beds), Bath-row, BIRMINGHAM, 15. HOUSE SURGEONS (Male or Female). 1 post vacant 1st October, 3 posts vacant 1st November. Recognised for F.R.C.S. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The hospital is the largest traumatic unit in the country and treats 50,000 new patients each year. Posts are open to registered practitioners and pre-registration applicants and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) **St. Matthew's Hospital, Burntwood** (1285 Beds)

Whole-time REGISTRAR in Psychiatry. Fulfils requirements of R.M.P.A. Resident. Married quarters available. Experience specialty essential.

(*b*) **City General Hospital, Stoke-on-Trent** (966 Beds)

Whole-time REGISTRAR in Psychiatry. Department comprises Mental Observation Ward (500 admissions a year); 150 Beds for chronic psychotics and mental defectives. Opportunity to study all aspects of adult psychiatry: Outpatient Department (4 sessions weekly) including E.C.T. Facilities for D.P.M.

(*c*) **Shelton Hospital, Shrewsbury** (1000 Beds)

Whole-time REGISTRAR in Psychiatry. Opportunities for outpatient clinic work. Single accommodation. General hospital experience an advantage.

(*d*) **Herefordshire Group of hospitals**

Whole-time REGISTRAR in General Surgery. Duties mainly at General (154 Beds—71 surgical beds including fracture and orthopædic) and County (310 Beds—40 surgical) Hospitals, Hereford. Post recognised for F.R.C.S. Resident.

(*e*) **South Warwickshire Group of hospitals**

Whole-time REGISTRAR in Chest Diseases. Duties at Warwick Hospital (350 Beds), Leamington Spa and Stratford-on-Avon Chest Clinics. Close association with thoracic surgical unit. Resident at Heathcote Hospital (29 Beds, increasing to approximately 54 Beds), and will take day-to-day responsibility for patients in Medical Research Council trials.

Posts (*a*) and (*c*) hospitals recognised for D.P.M.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned before 5th October, 1953.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS AND THE BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications are invited for the joint whole-time appointment of NON-RESIDENT RADIOLOGICAL REGISTRAR (Senior Registrar grade). The duties will be apportioned at 5 sessions in the Teaching Hospital and 6 sessions in the Dudley Road Hospital Group, mainly at Dudley Road Hospital. The appointment will be for 1 year in the first instance. Candidates must be registered medical practitioners, have had previous experience in the specialty and possess a Diploma in Radiology.

Forms of application may be obtained from the Secretary and Principal Administrative Officer, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned not later than 3rd October, 1953.

2nd September, 1953.

BIRMINGHAM (near). ST. MARGARET'S HOSPITAL, GREAT BARR PARK, BIRMINGHAM. 22A. (For mental defectives—1470 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required at above Hospital. Salary £700–£50–£1000 p.a. Accommodation and board in Hospital available for which a charge of £130 p.a. will be made.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be forwarded immediately to the Medical Superintendent.

BIRMINGHAM (near). MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. HOUSE SURGEON (obstetrics) required. Post vacant 1st November, 1953. 126 obstetric and 10 gynæcological beds. Post recognised for Diploma and obstetric part of Membership of Royal College of Obstetricians and Gynæcologists. Hospital affiliated to Birmingham Medical School for training of students.

Detailed applications, accompanied by copies of 3 recent testimonials, to the Secretary, Hospital Management Committee, Dudley-road Hospital, Birmingham, 18.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.)

1. SENIOR HOUSE OFFICER (anæsthetics). Recognised for D.A.
2. SENIOR HOUSE OFFICER (E.N.T. Department). Recognised for D.L.O. and F.R.C.S.
3. HOUSE OFFICER (E.N.T. Department). Recognised for D.L.O.

This is a busy General Hospital with a large Outpatient Department and the posts offer excellent opportunities for experience under Consultant Staff.

Applications, with references, to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (347 Beds.) RESIDENT HOUSE OFFICER (gynæcology and obstetrics). Recognised for gynæcology for Membership of R.C.O.G. This is a busy general hospital with a large Outpatient Department, and the post offers excellent opportunities for experience under Consultant Gynæcologists and Obstetricians.

Applications with references to the Hospital Secretary.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

SENIOR HOUSE OFFICER (anæsthetics) required. Recognised for D.A. and F.F.A.R.C.S. Residence at Queen's Park Hospital, Blackburn, with duties there, Blackburn Royal Infirmary and Accrington Victoria Hospital as arranged by Consultant in charge.

SENIOR HOUSE OFFICER (pædiatrics) required. Recognised for D.C.H. Residence at Park Lee Hospital, Blackburn, with such duties as required by Consultant Pædiatrician at the Royal Infirmary and Queen's Park Hospital, Blackburn, and Accrington Victoria Hospital.

Both posts fall vacant on or about 1st October, 1953.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BEDFORD GENERAL HOSPITAL. (435 Beds.) Bedford GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON required. The appointment offers exceptional opportunities for general experience in a busy Acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be forwarded to the Group Secretary, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (435 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (resident) required at above Hospital. Hospital may be visited by direct appointment. Post vacant 1st October, 1953.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 2nd October, 1953.

BEXHILL-ON-SEA. BEXHILL HOSPITAL. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. (A small modern hospital on the South coast.) Considerable acute surgical work and busy Outpatient Department. Excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of HOUSE OFFICER (medical), Male or Female, first, second, or third post held, with primary attachment to Pædiatric Ward of 24 Beds, and other duties in connection with 8 skin-beds and Casualty Department. Salary £350–£450 p.a., less £100 p.a. for residential emoluments. Appointment to commence 1st October, 1953.

Applications, stating nationality, age, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary as soon as possible.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (350 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary SURGICAL REGISTRAR at the above Hospital. Appointment to commence 1st October, 1953, or as soon thereafter as possible, for a period of 6 months. Salary at the rate of £775–£890 p.a., less £130 p.a. for residential emoluments.

Applications, giving fullest details, together with copies of recent testimonials or the names of referees, to the Hospital Secretary.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. for residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Applications are invited for the following appointments:—

Southmead Hospital, Bristol (571 Beds, including 133 maternity)

SENIOR HOUSE OFFICER (anæsthetics). Post recognised for D.A.

HOUSE OFFICER (anæsthetics). Post recognised for D.A.

Applications to be submitted to the Group Secretary, Southmead Hospital, Bristol.

BRISTOL. STAPLETON HOSPITAL. (850 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (additional third post). Salary £700–£50–£1000. Furnished accommodation available, together with board and laundry for which a charge of £120 p.a. is made. If a married man is appointed a reasonable charge will be made in respect of the wife. The Hospital is developing rapidly and houses the Geriatric Unit for Bristol Clinical Area. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and chronic cases and there is ample time for postgraduate study.

Applications, stating age, nationality, whether married or single, experience, qualifications, and names and addresses of 2 referees, to be sent to the Group Secretary, Stapleton Hospital Management Committee, 200, Manor-road, Fishponds, Bristol, within 14 days of the appearance of this advertisement.

BRISTOL CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR in the Department of Neurosurgery, Frenchay Hospital, Bristol. The appointment will be held for 1 year in the first instance, but may be renewed thereafter on an annual basis.

Applications (12 copies), stating date of birth, qualifications and experience together with 12 copies of 2 testimonials and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 3rd October, 1953.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. Locum HOUSE SURGEON required in Department of Neurosurgery (38 Beds) for period 3rd–31st October, 1953.

Applications to Group Secretary, Frenchay Hospital, Bristol.

BRADFORD CHILDREN'S HOSPITAL. (102 Beds.) 2 HOUSE OFFICERS (Female), 1 vacant now, 1 vacant 1st November. Salary £350–£450 p.a., less £100 p.a. residential emoluments. Hospital recognised for D.C.H.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL.

HOUSE SURGEON (E.N.T.), vacant now.

HOUSE SURGEON (ophthalmology), vacant now.

Hospital recognised for D.L.O., D.O.M.S., and F.R.C.S. Salary for each post £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY.

ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant 1st October.

HOUSE OFFICER (anæsthetics), vacant 5th October.

Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary.

BRADFORD. ST. LUKE'S HOSPITAL.

SENIOR ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now. Salary £670 p.a., less £130 p.a. residential emoluments.

HOUSE OFFICER (pædiatrics), vacant 4th October.

HOUSE SURGEON (general and casualty), vacant now.

HOUSE SURGEON (general and plastic), vacant now.

ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now.

Salary for above 4 posts £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRIGHTON GENERAL HOSPITAL, Elm-grove, BRIGHTON, 7. CASUALTY/MEDICAL OFFICER (for casualty and general duties). Post vacant on the 26th September, 1953. Salary £350–£450 p.a., less residential emoluments.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, to the Physician-Superintendent.

BRIGHTON GROUP HOSPITALS. 2 House Surgeons for duties in the E.N.T. Department (78 Beds). Vacant mid October. Recognised for F.R.C.S., and D.L.O.

Applications, with details of experience, &c., and names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) CASUALTY HOUSE SURGEON (1 of 3), including duties with Orthopædic and Traumatic Unit. Pre-registration post and recognised for F.R.C.S. from 1954. Vacant early October.

Applications, giving details of age, experience, &c., together with names and addresses of 2 referees, to be sent to the Administrative Officer.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE OFFICER (orthopædic surgery), first, second, or third post. Post tenable for 6 months and is recognised under F.R.C.S. regulations. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Locum SENIOR HOUSE OFFICER required for Surgical Tuberculosis Unit, comprising chiefly orthopædic tuberculosis, genito-urinary tuberculosis, and other non-pulmonary and combined lesions. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BOLTON DISTRICT GENERAL HOSPITAL. (545 Beds.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

RESIDENT HOUSE PHYSICIAN (second or third appointment) for the Department of Pædiatrics. Vacant 20th October, tenable for 6 months. Hospital recognised for D.C.H.

RESIDENT HOUSE SURGEON for general surgical duties. Vacant 1st October, tenable for 6 months and recognised under the Pre-registration Service scheme.

Applications, stating age, nationality, qualifications and experience and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BRECHIN, ANGUS. STRACATHRO HOSPITAL. (680 Beds.) Applications are invited for the pre-registration appointment of HOUSE PHYSICIAN which will shortly become vacant.

Applications, stating age and experience and accompanied by 2 testimonials or naming 2 referees, should be addressed to the Medical Superintendent within 10 days of the appearance of this advertisement.

BRECHIN, ANGUS. STRACATHRO HOSPITAL. (680 Beds.) Applications are invited for the pre-registration appointment of HOUSE SURGEON which will shortly become vacant.

Applications, stating age and experience and accompanied by 2 testimonials or naming 2 referees, should be addressed to the Medical Superintendent within 10 days of the appearance of this advertisement.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. POOLE GENERAL HOSPITAL, POOLE, and ALDERNEY INFECTIOUS DISEASES HOSPITAL, PARKSTONE. HOUSE PHYSICIAN required (Male or Female). Post vacant 28th September, 1953. This appointment carries divided duties between the 2 Hospitals.

Applications to the Hospital Secretary, Poole General Hospital, Dorset.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 18 hospitals with 1548 Beds. The orthopædic work is conducted mainly at the 2 major hospitals of the Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital, with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN, vacant 16th October. The appointment is recognised for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

CAMBORNE. TEHIDY CHEST HOSPITAL. (190 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON for the new Thoracic Surgical Unit which will finally extend to approximately 40 Beds, in modern surgical block. Salary £350–£450, less £100 p.a. residential emoluments.

Apply to the Hospital Secretary, Tehidy Chest Hospital, Camborne.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (265 Beds.) GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON. The above post, which is recognised for the F.R.C.S. Diploma, is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. THE UNITED CARDIFF HOSPITALS. SENIOR HOUSE OFFICER required in the Orthopædic Department.

Application forms from Secretary, Cardiff Royal Infirmary.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) Applications are invited for the post of HOUSE PHYSICIAN for general medical duties. Appointment subject to medical examination.

Applications, stating age, qualifications and experience, together with copies of 3 testimonials, should reach the Secretary by 3rd October.

CARSHALTON, SURREY. ST. HELIER HOSPITAL, Wrythe-lane. (741 Beds.) ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR SURGICAL REGISTRAR (whole-time) for an Acute Surgical Unit of 80 Beds.

Forms of application, returnable within 14 days of the appearance of this advertisement, may be obtained from the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

CHELMSFORD. ST. JOHN'S HOSPITAL. Full-time Locum Tenens SENIOR REGISTRAR required in the Department of Pathology for a period of 6 months. Resident. To work mainly at St. John's Hospital with some duties at the Chelmsford and Essex Hospital. Knowledge of morbid anatomy an advantage.

Applications to the Secretary, Hospital Management Committee, Chelmsford Group, London-road, Chelmsford, Essex.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer), resident and tenable for 6 months. It offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for the Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off-duty time is generous and the post is one likely to suit both an Officer seeking a higher qualification in surgery or one intending General Practice. The vacancy will occur in September. Salary £670 p.a., with £130 deduction for residential emoluments.

Apply Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford, Essex.

CHEPSTOW, MON. MEMORIAL WARDS. (150 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (tuberculosis) required about 1st October. A Senior Hospital Medical Officer is also resident and the Consultant visits regularly. Hospital situated conveniently on outskirts of town. Salary £700–£50–£1000, less £150 for board-residence.

Write, quoting 2 referees, to T. A. JONES,
64, Cardiff-road, Newport, Mon.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (430 Beds.) The post of SENIOR HOUSE OFFICER in the Gynæcological and E.N.T. Departments is now vacant.

Applications, together with testimonials, or names of referees, should be sent to the Physician-Superintendent as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (443 Beds.) Required SENIOR HOUSE OFFICER ANÆSTHETIST. Appointment recognised for the D.A. and the F.F.A. R.C.S. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at above Hospital. Post recognised for F.R.C.S. Resident staff of 6 : Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £670 p.a., less residential charge.

Applications, stating age, experience and qualifications, with references or names of referees, to Senior Administrative Officer.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (160 Beds.) (Recognised by the Royal College of Surgeons and for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, and £450 p.a. (plus grant of £50 p.a.), according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

COLCHESTER. ESSEX COUNTY HOSPITAL. (189 Beds.) Applications invited for post of HOUSE OFFICER to Casualty and Radiotherapy Departments at above Hospital. First, second, or third post ; tenable for 6 months. Post recognised for F.R.C.S. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COTTINGHAM. E. YORKS. Senior House Officer for Raywell Sanatorium (48 Beds) and JUNIOR HOSPITAL MEDICAL OFFICER for Castle Hill Sanatorium (221 Beds) to work under supervision of Consultant Chest Physician. Sanatoria part of Group with major Thoracic Surgery and Mass Radiography Units and laboratory facilities.

Application forms from Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, E. Yorkshire.

COULSDON, SURREY. CANE HILL HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time appointment of REGISTRAR at the above Psychiatric Hospital. The Hospital serves a large area in South London, where it has 4 outpatient clinics ; it also undertakes postgraduate teaching in association with the Institute of Psychiatry. Candidates should have had previous general and psychiatric hospital experience. Every facility will be given for further study, both within the hospital and outside. Holders of the post may be resident (if unmarried) or non-resident. Canvassing will disqualify but candidates may visit the hospital by arrangement with the Physician-Superintendent.

Application forms, for which a stamped addressed foolscap envelope should be supplied, may be obtained from the Group Secretary at the above address, and are returnable not later than 14 days after the appearance of this advertisement.

CROYDON GENERAL HOSPITAL. (200 Beds.) Locum Tenens SURGICAL REGISTRAR (whole-time) required for 24th September–14th October inclusive. Applicants should have had considerable surgical experience and possession of higher surgical qualification an advantage.

Apply, giving particulars of age, qualification and experience to— GEORGE A. PAINES, Secretary,
Croydon Group Hospital Management Committee,
General Hospital, Croydon.

CROYDON GENERAL HOSPITAL. (200 Beds.) Casualty OFFICER (Senior House Officer grade) for period of 6 months in first instance commencing 21st September. Post is recognised for final F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) House SURGEON (pre-registration post) for period of 6 months from 5th October.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

COVENTRY AND WARWICKSHIRE HOSPITAL. (346 Beds.) HOUSE PHYSICIAN required 1st October. Post offers wide experience in general medicine.

Applications to the Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY HOSPITALS. Resident Senior House OFFICER in Anæsthetics required, now vacant. Duties at Coventry and Warwickshire and Gulson Hospitals. Salary £670 p.a. Hospitals recognised for F.F.A.R.C.S. Excellent experience in all types of general anæsthetics.

Applications to the Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY. GULSON HOSPITAL. (329 Beds.) House PHYSICIAN required (House Officer status), vacant 31st October. 87 general medical beds.

Applications to the Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY GROUP OF HOSPITALS. Whole-time SENIOR REGISTRAR in Radiodiagnosis. Duties mainly at Coventry and Warwickshire Hospital. Experience specialty essential. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with the arrangements for the interchange of registrars agreed between the 2 Boards.

Application forms from Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 5th October, 1953.

DAGENHAM HOSPITAL, Rainham-road South, Dagen-HAM. There is a vacancy for the position of RESIDENT MEDICAL OFFICER (chest diseases) (Junior Hospital Medical Officer status) at the above Hospital of 129 Beds for pulmonary tuberculosis—all stages. Salary £700 (for an Officer appointed not less than 2 years after registration as a medical practitioner)–£50–£1000 p.a. Sound knowledge in general medicine and experience in modern treatment of tuberculosis essential. Further particulars available from the Physician-Superintendent.

Applications, stating age, qualifications, and previous experience, together with recent testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement. G. AUSTIN HEPWORTH, Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners with experience for the post of SURGICAL REGISTRAR (Senior House Officer) which is one of a surgical team of 2 Registrars and 1 House Officer responsible for surgical beds and casualty. The post is recognised for the F.R.C.S.(Eng.). Salary £670 p.a., deduction of £150 p.a. for full residential emoluments. The post is tenable for 12 months and is renewable annually.

Apply with references, stating age and experience, to—
G. W. BECKWITH, Group Secretary.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners for the appointment of RESIDENT ANÆSTHETIST, now vacant. The Hospital is recognised for study for the D.A. Salary £670 p.a.

Apply, with references and full details, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE.
SENIOR HOUSE OFFICER (anæsthetics) at Joyce Green Hospital, Dartford.
HOUSE SURGEON (orthopædics) at the Southern Hospital, Dartford.
HOUSE OFFICER (E.N.T. and ophthalmology) at the Southern Hospital, Dartford.
HOUSE OFFICER (gynæcology and obstetrics) at the West Hill Hospital, Dartford.

Applications, stating age, qualifications, experience, nationality, and the names of 2 persons to whom reference may be made, to be sent for House Officers to the Medical Superintendent of the hospital concerned, and for Senior House Officer to the Group Secretary, Dartford Hospital Management Committee, the Bow Arrow Hospital, Dartford.

DEAL. VICTORIA HOSPITAL. Applications are invited from medical practitioners for the post of RESIDENT MEDICAL OFFICER at the above Hospital. Appointment provides excellent experience for persons intending to enter general practice. There is a regular Consultant Visiting Staff for all branches of medicine and surgery. Salary £450 a year. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

DERBY. CITY HOSPITAL. House Surgeon (pre-registration) or SENIOR HOUSE OFFICER.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent, City Hospital, Derby, as soon as possible.

DERBY. CITY HOSPITAL (66 maternity beds) and QUEEN MARY MATERNITY HOME (36 Beds). HOUSE SURGEON (obstetrics) or SENIOR HOUSE OFFICER for duties at both the above Hospitals. The post is resident at the Derby City Hospital. Vacant October.

Applications, stating age, qualifications and experience, with copies of 2 testimonials, should be forwarded immediately to the Medical Superintendent, Derby City Hospital.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. DERBY AREA NO. 1 HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) or SENIOR HOUSE OFFICER required 14th October.

Applications, with 2 names for reference, should be sent to the Secretary, No. 1 Hospital Management Committee, Babington-lane, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (ophthalmic) required 1st October, 1953. Recognised for F.R.C.S.

Applications, with copies of 2 recent testimonials, should be sent to the Hospital Secretary.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING, SURREY. (252 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology with some general surgery. Vacant now for 1-years appointment (renewable). Post recognised for D.Obst.R.C.O.G.

Apply to the Medical Superintendent.

DEWSBURY, STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) A vacancy exists for a RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade). House available on rental if required. The Hospital has a Medical Unit of 68 adult beds and 34 beds for children. The Resident Medical Officer has 2 resident House Physicians to assist him.

Applications, giving full details of experience, &c., should be addressed to the Group Secretary at 20, Oxford-road, Dewsbury.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the F.R.C.S.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SECOND CASUALTY OFFICER (Senior House Officer) at above Infirmary. Salary £670 p.a., from which a deduction at the rate of £130 p.a. will be made for residential emoluments.

Applications, stating age, qualifications, and details of present and previous appointments with dates, and enclosing copies of 3 recent testimonials, should be forwarded to—

ARTHUR JONES, Secretary to the Committee.

Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship examination of the Royal College of Surgeons.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON. The post is approved for Pre-registration Service under the Medical Act, 1950. Salary at the rate of £350, £400, or £450 p.a. from which a deduction at the rate of £100 p.a. will be made for board, residence, &c. Post vacant end September.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be forwarded to—

ARTHUR JONES, Secretary to the Committee.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship and D.L.O.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the whole-time post of SENIOR HOUSE OFFICER (E.N.T. Department) in accordance with the terms and conditions of service for hospital medical and dental staffs (England and Wales). Salary at the rate of £670 p.a., less £130 p.a. for board, residence, &c.

Applications, stating age, education, qualifications, and details of present and previous appointments with dates, together with copies of 3 testimonials, should be forwarded to—

ARTHUR JONES, Group Secretary.

Doncaster Royal Infirmary.

DONCASTER. ROYAL INFIRMARY. Sheffield Regional HOSPITAL BOARD. Whole-time REGISTRAR (pathology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th September, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DORCHESTER. DORSET COUNTY HOSPITAL. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. WEST DORSET GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SURGICAL REGISTRAR (Registrar grade) at above Hospital, vacant mid-November, 1953. Salary according to experience, with a deduction at the rate of £160 p.a., if resident.

Application forms, which should be returned by 3rd October, 1953, are obtainable from the Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

DOVER. ROYAL VICTORIA HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital. The post is recognised by the Royal College of Surgeons. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. SENIOR SURGICAL CASUALTY HOUSE OFFICER (resident) required at above Hospital. Salary £670 p.a. Deduction of £130 p.a. for board, lodging, &c. Post vacant 17th October, 1953.

Applications, giving details of age, qualifications, and experience, together with the names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, not later than 26th September, 1953.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds, 78 general surgical beds.) Applications are invited for post of HOUSE SURGEON becoming vacant 26th September, 1953. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to reach Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 26th September, 1953.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (pathology) to fill an immediate vacancy. Salary on national scale, less deduction for board, lodging, &c. Busy department in large general hospital, with easy access to London. Some experience in pathological department desirable.

Applications, with copies of 2 recent testimonials, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 26th September, 1953.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN at the above Hospital. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating qualifications and the names and addresses of 2 referees, should be forwarded to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Mental Deficiency and Child Psychiatry, Little Plumstead Mental Deficiency Colony (900 Beds), near Norwich. Large outpatient service (including child guidance). Recognised by R.M.P.A. for training in both child psychiatry and mental deficiency. A house is available.

Applications, stating age, qualifications, and details of present and previous appointments, with names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 28th September, 1953. Candidates invited to visit colony by direct arrangement with Medical Superintendent.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following HOUSE OFFICER appointments which are now vacant :—

Cumberland Infirmary, Carlisle (340 Beds)

1—General Surgery.
1—Orthopædics.
1—" Specials "—(E.N.T. and Eyes).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL. 2 JUNIOR HOUSE OFFICERS. E.N.T. and general locum duties.

Apply to Medical Superintendent.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. Applications are invited for the post, vacant as from 4th October, 1953, of CASUALTY OFFICER (Senior House Officer).

Applications, giving nationality, age, experience, &c., together with names of 2 referees, should be sent to the Hospital Secretary, Grimsby General Hospital, Grimsby.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (gynæcological), Male or Female, for duties at the above-named Hospital and Scartho Road Infirmary, Grimsby. The post is now vacant.

Applications, with names of 2 referees, to Hospital Secretary, Grimsby General Hospital.

GRIMSBY MATERNITY HOSPITAL. (45 Beds.) Applications are invited for the post of SENIOR OBSTETRIC HOUSE OFFICER (resident), vacant now. A large proportion of abnormal cases are treated.

Apply immediately, with names of 2 referees, to the Secretary, Grimsby Hospital Management Committee, 3, Queen's-parade, Grimsby.

HALIFAX AREA HOSPITALS MANAGEMENT COMMITTEE. Applications invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics for duty at Royal Halifax Infirmary (301 Beds) and Halifax General Hospital (425 Beds), both busy acute general hospitals.

Applications, to be forwarded to Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Resident, Male or Female. Pre-registration post now vacant. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic), post vacant now. National scale of salary.

Apply to Hospital Administrator.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (151 Beds—Recognised by the Royal College of Surgeons and for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, or £450 p.a., plus grant of £50 p.a., according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HEMEL HEMPSTEAD, HERTS. WEST HERTS HOSPITAL. (167 Beds—5 residents.) HOUSE PHYSICIAN to Children's Department required (second or subsequent post). The appointment is recognised for the D.C.H.

Applications, giving details of experience and qualifications, and enclosing copies of 2 recent testimonials, should be sent to the Administrator.

HEREFORD. COUNTY HOSPITAL. (333 Beds.) House OFFICER (general surgery) required.

Applications, with copies of 2 recent testimonials, to be sent to the Medical Superintendent, County Hospital, Hereford.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Salary at rate of £400 p.a., less £100 for residential emoluments. Duties to commence 5th October, 1953.

Applications, to Group Secretary Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

RESIDENT SURGICAL OFFICER (Senior House Officer grade). Recognised for F.R.C.S.
CASUALTY OFFICER (Senior House Officer grade).
E.N.T. HOUSE SURGEON (Senior House Officer grade). Recognised for F.R.C.S. and D.L.O.
2 HOUSE SURGEONS (recognised for F.R.C.S.).
2 HOUSE PHYSICIANS (1 recognised for M.D. (Lond.)).
ORTHOPÆDIC HOUSE SURGEON.

Forms of application from the Hospital Secretary, Hu Royal Infirmary.

HULL B GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens SENIOR HOUSE OFFICER required for Group Sanatoria, with which are associated major Thoracic Surgery Unit, Mass Miniature Radiography Unit and full laboratory facilities. £13 per week, less board charge.

Apply Group Secretary, De la Pole Hospital, Willerby, E. Yorkshire.

HULL, E. YORKS. MATERNITY HOSPITAL. (74 Beds.) Recognised for M.R.C.O.G. (obstetrics). HOUSE OFFICER required. Post tenable for 6 months. Salary £350–£450 p.a., according to experience, less £100 for residential emoluments.

Apply to Group Secretary, Hull Royal Infirmary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. (143 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 HOUSE SURGEON posts. These posts are for a term of 6 months in each case and are now vacant. Both count towards D.C.H. qualification. Salary as per national terms of service.

Replies, with testimonials, to be sent to the Hospital Secretary.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX (General Acute—81 Beds) invite applications for appointment of RESIDENT HOUSE SURGEON; duties include Casualty Department. 6 months appointment. National Health Service salary and conditions of service.

Applications, stating qualifications, age, &c., with copies of up to 3 recent testimonials or names for reference, to the Hospital Secretary.

HOVE GENERAL HOSPITAL, Sackville-road, Hove, 3. HOUSE SURGEON AND CASUALTY OFFICER (recognised for F.R.C.S.). Post vacant about 7th September. Salary and conditions of service in accordance with national scale (£350–£450, less £100 p.a. for residential emoluments).

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds. 3 Resident Medical Officers.) SENIOR HOUSE OFFICER (recognised for the F.R.C.S.), vacant early in October. Duties are mainly those of Resident Surgical Officer. Salary £670 p.a., less £150 for residential emoluments. Appointment for period of 1 year.

Applications, with full particulars of qualifications, experience, &c., with names and addresses of 2 referees, to the Administrative Officer.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS required, to commence duty immediately. The posts are recognised as pre-registration appointments. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. RAIGMORE HOSPITAL. 2 ORTHOPÆDIC HOUSE SURGEONS required. Orthopædic Department 140 Beds. Posts recognised for pre-registration training.

Applications, with references, to Medical Superintendent.

IPSWICH. BOROUGH GENERAL HOSPITAL, Heath-road, IPSWICH. (275 Beds.) Applications invited for the pre-registration post of HOUSE SURGEON to a General Surgeon. The post, which is recognised for the R.C.S. examinations is normally of 6 months duration, and is of House Officer grade.

Applications, stating experience and with copies of recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department. The post is graded Senior House Officer and is now vacant. The Department has 2 Consultants, about 60 Beds, and a large outpatients attendance and offers a wide experience.

Applications, stating age, nationality, experience, and copies of 3 recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consultant Surgeon. The post is recognised for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, stating age, nationality, experience, and copies of recent testimonials, to the Hospital Secretary.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (144 Beds.) RESIDENT HOUSE SURGEON (either sex), general surgery and orthopædic (first, second or third post), vacant now. Approved pre-registration appointment. Tenable for 6 months. Practitioners registered before 1st January, 1953, may also apply.

Applications, with full particulars and copies of testimonials, to be sent to—

J. YOUNG, Group Secretary, Bingley, Keighley, Skipton and Settle Hospital Management Committee.

St. John's Hospital, Keighley.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Lincoln NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgery). The post is recognised for F.R.C.S. Terms and conditions of service in accordance with those published for hospital medical and dental staffs.

Applications, together with copies of 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

R. W. HOWICK, Group Secretary.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the following posts in the Department of Neurosurgery at the General Infirmary at Leeds :—

RESIDENT NEUROSURGICAL OFFICER. This post is of Senior House Officer status and will be for 1 year in the first instance.

NEUROSURGICAL HOUSE OFFICER. This is a Junior House Officer post which is approved for Pre-registration Service.

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be forwarded to the undersigned not later than 23rd September, 1953.

S. CLAYTON FRYERS, Secretary to the Board.

General Infirmary, Leeds, 1.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of SENIOR REGISTRAR in Psychiatry for duties at Stanley Royd Hospital, Wakefield (2000 beds) and associated clinics. Accommodation for a single person is available. It is anticipated that the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University of Leeds. Candidates must hold the D.P.M. or equivalent qualifications.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 9th October, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

General Medicine

Harrogate and Ripon group (non-resident). Includes some duties in pædiatrics.

General Surgery

(*a*) Dewsbury, Batley and Mirfield group (resident).
(*b*) Harrogate and District General Hospital (resident).
(*c*) Halifax General Hospital (resident).
(*d*) Keighley and District Victoria Hospital (resident/non-resident).

Infectious Diseases

Leeds Road Hospital, Bradford (resident).

Orthopædic Surgery

(*a*) York A and Tadcaster group (non-resident) for duties mainly at York General and City Hospitals.

(*b*) Huddersfield Royal Infirmary and other hospitals in the Huddersfield group (non-resident).

Psychiatry

(*a*) Storthes Hall Hospital, Kirkburton, near Huddersfield, and associated clinics. The post will be resident and a flat is available.

(*b*) Naburn and Bootham Park Hospital, York.

(*c*) St. James's Hospital, Psychiatric Unit, Leeds. This post is resident and offers special opportunity for experience with neurotic and psychosomatic patients.

Facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 28th September, 1953.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of REGISTRAR (resident) in Anæsthetics for duties in the Halifax group.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 26th September, 1953.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (gynæcology), tenable 1st October, 1953. The appointment, although recognised as a pre-registration house post, affords excellent experience, is suitable for a registered medical practitioner, and is recognised by the Royal College of Obstetricians and Gynæcologists for Membership.

Applications, with copy of 1 testimonial and names of 2 referees, should be forwarded to the Administrative Medical Officer, St. James's Hospital, Leeds, 9, as soon as possible.

LEIGH INFIRMARY, Leigh. (102 Beds.) Wigan and LEIGH HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Male or Female) required at the above Hospital. House Officer grade post, now vacant. Approved pre-registration post.

Applications, stating age and qualifications, together with the names of 2 referees, should be forwarded to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan, as early as possible.

LIVERPOOL, 14. BROADGREEN HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Regional Thoracic Surgical Centre. Salary £670 p.a., less £130 p.a. in respect of residential emoluments.

Applications, on forms obtainable from the undersigned at the above address, to be returned not later than 10 days after the appearance of this advertisement.

H. BLYTHE, Group Secretary.

LIVERPOOL, 9. WALTON HOSPITAL, Department OF PSYCHIATRY. (39 Beds.) A vacancy exists for a SENIOR HOUSE OFFICER in Psychiatry from 1st October, 1953.

Applications to Physician-Superintendent.

LIVERPOOL, 9. WALTON HOSPITAL. The post of SENIOR HOUSE OFFICER in Chest Diseases is vacant from 1st October, 1953. Duties include work in Outpatient Refill Clinic and in wards. Appointed candidate will work with the Chest Physician and Thoracic Surgeon to the Hospital.

Forms of application can be obtained from Physician-Superintendent.

LIVERPOOL, 9. WALTON HOSPITAL. The following HOUSE OFFICER appointments are vacant from 1st October, 1953 :—

Surgery (4)
Medicine (2)
Orthopædics (1)

Provisionally registered practitioners are eligible.

Applications to Physician-Superintendent.

LIVERPOOL, 5. JOHN BAGOT HOSPITAL. Junior HOSPITAL MEDICAL OFFICER required. Duties entail day-to-day responsibility for patients at the John Bagot Hospital (convalescent annexe to Walton Hospital) and at Westminster House (geriatrics). The successful candidate will reside in the John Bagot Hospital. This post is suitable for a candidate studying for a higher qualification and opportunity will be given for experience in a selected specialty at Walton Hospital.

Application forms from Secretary, Walton Hospital, Liverpool, 9.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of REGISTRAR in Dermatology for 1 year from 1st October, 1953 (or as soon as possible thereafter), to 30th September, 1954.

Apply by 30th September, 1953, on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of SENIOR HOUSE OFFICER in Orthopædics for the period 1st October, 1953, to 30th September, 1954.

Apply as soon as possible on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for temporary posts as ORTHOPÆDIC HOUSE SURGEONS, at :—

David Lewis Northern Hospital,*
Royal Liverpool Children's Hospital,

for the period to 28th February, 1954. The posts are open to registered practitioners and pre-registration applicants. The person appointed to the post marked * will be required to undertake some casualty work as part of his normal duties.

Apply as soon as possible with full details to the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. ROYAL LIVERPOOL CHILDREN'S HOSPITAL. Applications are invited for a temporary post of HOUSE SURGEON for the period to 28th February, 1954. The post is open to registered practitioners and pre-registration applicants.

Apply as soon as possible with full details to the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for temporary posts as CASUALTY OFFICERS (House Officer grade) for the period to 28th February, 1954, at :—

Royal Southern Hospital.
Royal Liverpool Children's Hospital.

The posts are open to registered practitioners (resident or non-resident) and to pre-registration applicants.

Apply as soon as possible with full details to the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) (Recognised training hospital for F.R.C.S.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (surgical) now vacant. Salary £670 p.a., less £150 for residential emoluments.

Applications, giving full particulars, with names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON now vacant. The post is recognised for the F.R.C.S. examination and Pre-registration Service.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medical), which will become vacant on 2nd October at this General Hospital. The national scale of salary applies and a deduction of £150 p.a. will be made for residential emoluments.

Applications, giving all details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics, gynæcology, and some other duties) which will become vacant at this General Hospital in October. The national scale of salary applies and a deduction of £150 p.a. will be made for residential emoluments.

Applications, giving all details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of HOUSE PHYSICIAN. Recognised as pre-registration post. Vacant 4th October, 1953. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, should be sent to the Secretary not later than the 29th September, 1953.

MAIDSTONE (near). LENHAM SANATORIUM. (172 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER at Lenham Sanatorium, near Maidstone. The Sanatorium has 172 Beds for the treatment of pulmonary tuberculosis. Salary £670 a year, with a deduction of £150 a year for residential emoluments. Appointment for 12 months.

Applications to Physician-Superintendent, Lenham Sanatorium, near Maidstone.

LLANELLY HOSPITAL. (164 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER for work in the Surgical Unit, and with duties in the Casualty Department of the above Hospital.

Full particulars, stating age, qualifications and experience, should be addressed to the undersigned.

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above hospital. There are 55 E.N.T. Beds and 6 specialist operating sessions each week. Valuable experience is available and the post is recognised for the purposes of the F.R.C.S. and the D.L.O. Salary will be £670 a year less £150 a year for residential emoluments.

Applications immediately to the Administrative Office, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON. Post recognisable for the F.R.C.S.(Eng.). Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

MANSFIELD. RANSOM SANATORIUM. Nottingham NO. 5 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER with effect from 1st November, 1953. The Sanatorium contains 185 Beds for the treatment of pulmonary tuberculosis in men, women, and children, including a modern Thoracic Surgery Unit. Salary £670 p.a., less £150 for full residential emoluments, which include a comfortable flat.

Applications, stating age, qualifications, and experience, and enclosing copies of 2 recent testimonials, to be sent to the Group Secretary, Harlow Wood Hospital, near Mansfield.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (207 Beds.) MANSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics (resident). The post is recognised for the D.A. Appointment will be for 1 year. Salary £670 p.a., with a deduction of £135 in respect of residential emoluments.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, should be forwarded to the undersigned immediately.

A. ASHWORTH, Group Secretary,
Mansfield Hospital Management Committee.
Oak Bank, Crow Hill-drive, Mansfield.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (207 Beds.) MANSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (pre-registration or Senior House Officer post). Post recognised for F.R.C.S. examinations.

Applications, stating age and qualifications, together with copies of 2 recent testimonials, to be forwarded to Group Secretary, Mansfield Hospital Management Committee, Crow Hill-drive, Mansfield.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) to commence as soon as possible. This appointment, in a busy General Hospital staffed by Manchester Consultants, affords excellent experience to suitably qualified candidates. Opportunity will be given to assist in the major surgical work of the Hospital. Post recognised under F.R.C.S. regulations.

Applications to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology) required to assist the Director of Pathology for the Group, which comprises Booth Hall Children's Hospital, Duchess of York Hospital for Babies, and Monsall Isolation Hospital. The main laboratory is at Booth Hall Hospital. Salary £670 p.a., less £155 p.a. if resident. Post tenable for 1 year in the first instance.

Applications to be sent as soon as possible to the Group Secretary, Booth Hall Hospital, Manchester, 9.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of REGISTRAR (resident). Tenable for 12 months subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the non-resident post of REGISTRAR in Orthopædic Surgery, to the Blackpool and Fylde Group of Hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, with copies of 2 recent testimonials, to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in the Board's Non-tuberculous Thoracic Surgery Unit of 48 Beds at Park Hospital, Davyhulme. 1-year appointment, renewable. Post now vacant.

Application forms from the Secretary, West Manchester Hospital Management Committee, Park Hospital, Davyhulme, Urmston.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. NON-RESIDENT REGISTRAR in E.N.T. Surgery required, with main duties at Hope and the Royal Manchester Children's Hospitals.

Applications, with copies of 2 recent testimonials, should be sent to the Group Secretary at Salford Royal Hospital, Salford, 3, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of ANÆSTHETICS REGISTRAR with duties in the South Manchester group, and at the Duchess of York Hospital for Babies, Manchester.

Applications, stating age, qualifications, present post, experience and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of appearance of this advertisement.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Anæsthetics. Recognised for 6 months under the D.A. regulations.

Apply, giving names of 2 referees, to the Group Secretary, Bury General Hospital, Bury, Lancs.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—426 Beds.)

1 SENIOR HOUSE OFFICER (general surgery). Post now vacant.

1 SENIOR HOUSE OFFICER (non-tuberculous thoracic surgery) for Manchester Regional Hospital Board Centre. Post vacant mid-October, 1953.

1 HOUSE OFFICER (E.N.T. surgery). (Pre-registration.) Post now vacant.

General surgery posts recognised for F.R.C.S. examination.

Forms from Secretary.

MIDDLESBROUGH. WEST LANE ISOLATION HOSPITAL. (224 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER. Salary £670 p.a., conditions of service being in accordance with the Ministry of Health regulations. The post offers facilities for experience in all branches of infectious diseases, pulmonary tuberculosis, and acute pædiatrics.

Applications, with copies of 2 recent testimonials, should be forwarded to the Physician-Superintendent, West Lane Hospital, Middlesbrough, as early as possible.

L. BRITTAIN, Secretary,
Cleveland Hospital Management Committee.

7th September, 1953.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. Whole-time RESIDENT MEDICAL OFFICER with general duties required at Senior House Officer rate of salary. This post offers excellent experience to anyone preparing to enter general practice. The Hospital has a busy Outpatient Department. Appointment for 1 year in first instance.

Apply to Secretary, General Hospital, Nottingham, giving age, nationality, qualifications and present and previous appointments and names of 3 referees.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the non-resident appointment of SURGICAL REGISTRAR to the Ophthalmic Department of the Royal Victoria Infirmary. The post will offer scope to prepare for a higher degree. The appointment is for 1 year in the first instance and will be subject to Ministry of Health terms and conditions of service for hospital medical and dental staffs in the National Health Service.

Applications, giving full details with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary,
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident post of SURGICAL REGISTRAR at the Royal Victoria Infirmary. The appointment will be for 1 year in the first instance and subject to the Ministry of Health terms and conditions of service.

Applications, giving full particulars and the names and addresses of 3 referees, should be sent to the undersigned not later than 28th September, 1953.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWPORT, I.W. ST. MARY'S HOSPITAL. (365 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Surgery. Salary £670 p.a. Applications are invited from registered medical practitioners.

HOUSE SURGEON. Post approved for Pre-registration Service. National salary scale and conditions. Vacant now.

Applications, stating age, nationality, qualifications, and experience, together with the names of 2 referees, to be sent as soon as possible to Group Secretary, Hospital Management Committee Headquarters, Clatterford House, Carisbrooke, I.W.

NEWTON ABBOT HOSPITAL. (General Section—65 Beds.) RESIDENT HOUSE SURGEON (Male or Female) required for 1st October, 1953. Married quarters available.

Applications, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

NOTTINGHAM GENERAL HOSPITAL. Resident House SURGEON required (Male or Female) for the above Hospital. Duties to commence on or about 1st September, 1953. Salary and conditions of service in accordance with published regulations. If held by R practitioner the appointment will be for a period of 6 months.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC AND FRACTURE REGISTRAR. The post offers exceptional experience in traumatic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident, £150 p.a. deducted for emoluments.

Applications, stating age, qualifications, nationality, present and previous appointments with dates, together with names and addresses of 3 referees to be sent to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th October, 1953.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC AND FRACTURE SENIOR HOUSE OFFICER. The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

NOTTINGHAM GENERAL HOSPITAL. Sheffield REGIONAL HOSPITAL BOARD. Whole-time Resident Locum REGISTRAR (orthopædics) required at the above Hospital. Remuneration at rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT ANÆSTHETIC SENIOR HOUSE OFFICER; duties to commence on or about 1st October. Terms and conditions of service in accordance with the published regulations of the Ministry of Health. £150 deducted for emoluments.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to the undersigned as soon as possible. HENRY M. STANLEY, Group Secretary.

NORTHAMPTON GENERAL HOSPITAL. (485 Beds.) Applications invited for following posts, vacant 1st October, 1953:—

Department of Anæsthetics, HOUSE OFFICER. Recognised for D.A. and for pre-registration.

General Surgery, HOUSE OFFICERS (2). Recognised for F.R.C.S. and for pre-registration.

Fracture and Orthopædic Department, HOUSE OFFICER. Recognised for F.R.C.S. and for pre-registration.

Casualty Department, SENIOR HOUSE OFFICER, to work in conjunction with House Officer, Casualty Department. Recognised for F.R.C.S.

Casualty Department, HOUSE OFFICER, to work in conjunction with Senior House Officer, Casualty Department.

All 6-month appointments in first instance. Deduction £100 a year residential emoluments.

Applications, enclosing copies of 3 testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTH SHIELDS. TYNEMOUTH VICTORIA JUBILEE INFIRMARY (109 Beds), Hawkey's-lane, NORTH SHIELDS, NORTHUMBERLAND. 1 RESIDENT HOUSE SURGEON appointment available now.

Applications to House Governor.

NUNEATON. MANOR HOSPITAL. (139 Beds.) House SURGEON required for general surgical duties including E.N.T. and ophthalmic work. Recognised for F.R.C.S. and pre-registration.

Applications to the Hospital Secretary.

NUNEATON. MANOR HOSPITAL. (139 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (32 general medical beds), vacant now. Pre-registration post.

Applications to the Hospital Secretary.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Pædiatrics to the hospitals of the Aylesbury and High Wycombe Hospital Management Committees resident at, and based on, Stoke Mandeville Hospital. The appointment will be for 1 year eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 3rd October.

PENZANCE. WEST CORNWALL HOSPITAL. (100 Beds—3 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required. Post vacant now. Good and varied experience in diagnosis, treatment and operative procedure.

Applications, stating age, experience and nationality, to the Hospital Secretary, West Cornwall Hospital, Penzance.

PETERBOROUGH. MEMORIAL HOSPITAL. Peterborough AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of SENIOR HOUSE OFFICER (orthopædic), vacant now. Salary £670 p.a. Exceptional experience offered in busy department.

Apply to the Secretary, Memorial Hospital, Peterborough.

POOLE GENERAL HOSPITAL. Bournemouth and EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required 1st October, 1953. Hospital recognised for the D.A. and F.F.A. R.C.S.

Applications to the Hospital Secretary.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MON. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical). This is the senior resident post. 2 House Surgeons and a House Physician also resident. Salary £700–£50–£1000, less £150 board-residence.

Write, quoting 2 referees, to T. A. Jones.
64, Cardiff-road, Newport, Mon.

PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pædiatrics) required for duties at Pontefract and Wakefield. Post recognised for Diploma in Child Health, and provides good experience for those going into general practice. Residence optional, but required to live in Wakefield area. Salary £670, less £130 if resident. Vacant 20th September.

Applications to Hospital Management Committee Secretary, Gt. Northern House, Salter-row, Pontefract, Yorkshire.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) SENIOR HOUSE OFFICER in Surgery, Devonport Section, recognised for the Fellowship of the Royal College of Surgeons, vacant 8th December, 1953.

(2) HOUSE SURGEON, Devonport Section, vacant 1st December, 1953.

(3) SENIOR HOUSE OFFICER in Surgery, Greenbank Road Section, vacant 9th October, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(4) SENIOR HOUSE OFFICER in Casualty and Fracture Department, Greenbank Road Section, vacant immediately.

(5) RESIDENT DENTAL HOUSE SURGEON, Greenbank Road Section, vacant 21st November, 1953, recognised by the Royal College of Surgeons as fulfilling the requirements of candidates for the Fellowship of Dental Surgery.

(6) HOUSE SURGEONS, Greenbank Road Section, vacancies 13th September, 17th and 20th October, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(7) RESIDENT ANÆSTHETIST, Greenbank Road Section, vacant immediately, recognised for the D.A.

(8) SENIOR HOUSE OFFICER in Surgery, Freedom Fields Section, vacant immediately, recognised for the Fellowship of the Royal College of Surgeons.

(9) SENIOR HOUSE OFFICER to Casualty and Traumatic Department, Freedom Fields Section, vacant immediately.

(10) HOUSE PHYSICIAN, Freedom Fields Section, vacant 1st January, 1954.

(11) HOUSE SURGEON in Obstetrics and Gynæcology, South Devon and East Cornwall Hospital, Plymouth, vacant 14th November, 1953, recognised for the Membership of the Royal College of Obstetricians and Gynæcologists.

Applications, stating age, nationality, qualifications, and experience, with the names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Devonport.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. INFECTIOUS DISEASES HOSPITAL. (310 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER, whose work will comprise duties in both infectious diseases and tuberculosis wards.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

RAMSGATE. GENERAL HOSPITAL. (101 Beds.) SENIOR HOUSE OFFICER (surgical). Recognised for F.R.C.S. and D.A. Salary £670 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited for the appointment, House Officer grade, of RESIDENT ASSISTANT PATHOLOGIST, vacant 16th October, for period 6 months. Previous experience in pathology unnecessary.

Applications, with full particulars, and copies of recent testimonials to Secretary.

REDHILL COUNTY HOSPITAL. (576 Beds.) Redhill GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON. Post vacant 1st October and is recognised for Pre-registration Service and F.R.C.S.

Apply to Group Secretary, Redhill County Hospital, Earlswood Common, Redhill, Surrey.

REDRUTH. CAMBORNE-REDRUTH HOSPITAL. (151 Beds—4 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required for the above Hospital. Post now vacant. This is a general hospital with a great variety of cases. The post gives good experience in diagnosis, operative and postoperative treatment, and in actual operative procedure to the candidate.

Applications, stating age, experience and nationality, together with references, to Hospital Secretary, Camborne-Redruth Hospital, Redruth, Cornwall.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Surgical Department) and 2 HOUSE SURGEONS (pre-registration posts) required at Caerphilly District Hospital, 6 miles from Cardiff, 144 Beds for acute general surgery, orthopædics, E.N.T., ophthalmology, gynæcology ; 26 Beds for general medicine ; busy Outpatient, Casualty and Pathology Departments staffed by full-time and visiting Consultants. Married quarters available. Senior House Officer post tenable 12 months ; salary £670, less agreed deduction for full residential emoluments. House Officer posts tenable 6 months ; salary £400, less agreed deductions for married quarters and emoluments at £100 p.a. for single residential emoluments.

Apply with full particulars to the Group Secretary, Hospital Management Committee, St. Martin's-road, Caerphilly, near Cardiff.

ROCHESTER. ST. BARTHOLOMEW'S HOSPITAL. (Recognised for D.A.) **MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the resident post of SENIOR HOUSE OFFICER in Anæsthetics for the Group. The principal duties will be at above Hospital and post will be tenable for 1 year. Salary £670 p.a.

Applications, giving full particulars, to be addressed to Group Secretary, 20, Star Hill, Rochester, Kent.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Pathology in this large General Hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. Applications are invited from registered medical practitioners for the post, now vacant, of SENIOR HOUSE OFFICER (resident) for duties in the Casualty and Admissions Department at the above Hospital. This is a large general hospital, with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed immediately to the Secretary of the Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, stating age, nationality, qualifications, experience, and 2 testimonials of recent date or names of 2 referees.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Department of Ophthalmology.

Applications, stating age, qualifications, present appointment and experience with dates, together with copies of 2 testimonials of recent date or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (91 Beds.) Applications are invited from registered medical practitioners (Male) for the post of RESIDENT HOUSE PHYSICIAN. The duties will include experience in gynæcology. 6 months appointment.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. (Recognised training hospital for D.A.) **SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th September, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. ABERDEEN : REGIONAL LABORATORY, CITY HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (pathology). The appointment offers wide experience in clinical pathology and tenure of the post is recognised for the Diploma in Clinical Pathology. Particulars of the appointment may be obtained from the Secretary, North-Eastern Regional Hospital Board, 1, Albyn-place, Aberdeen.

Applications and the names of 2 referees should reach the Secretary not later than 26th September, 1953.

31st August, 1953.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Supernumerary SENIOR REGISTRAR to the Orthopædic Department of the Royal Infirmary of Edinburgh. The appointment will be for 1 year in the first instance and subject to annual renewal, and the salary will be at the rate of £1300 p.a. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, previous experience and qualifications, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Psychiatry based at Glasgow Royal Mental Hospital, which will be for 1 year in the first instance. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 29th September, 1953.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for the D.A.) Applications are invited from suitably qualified practitioners, Male or Female, for the resident appointment of SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st October. The post offers a wide experience in anæsthesia for general surgery, obstetrics and gynæcology and in the Departments of Urology and Thoracic Surgery.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and names of 2 persons to whom reference may be made, should be forwarded to the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Secretary.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (anæsthetics) required at City Hospital, Nottingham. (Recognised training hospital for D.A.) The post is interchangeable with a similar one at the Nottingham Hospital for Women and the Nottingham Children's Hospital. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th September, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SENIOR HOUSE OFFICER or REGISTRAR (if in possession of D.M.R., Part I) required for the Derby Radiotherapy Centre at the Derbyshire Royal Infirmary. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from general registered practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON in General Surgery. Vacant immediately, and tenable in the first instance for 6 months. Recognised for the F.R.C.S., and approved for pre-registration service. Salary and conditions of service in accordance with national scale.

Applications with references, should be sent to—

J. P. MALLETT, Group Secretary,
Group 15 Hospital Management Committee.
Royal Salop Infirmary, Shrewsbury. 27th July, 1953.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). The successful applicant will be allowed to attend for 2 days a month at The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study with the Consultant. The post is recognised under the revised Fellowship regulations in respect of the 6 months training required of candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to—

J. P. MALLETT, Group Secretary,
Group 15 Hospital Management Committee.
Royal Salop Infirmary, Shrewsbury, 10th July, 1953.

SHREWSBURY. ROYAL SALOP INFIRMARY. Shrewsbury GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the post of SENIOR HOUSE OFFICER or HOUSE OFFICER (pædiatric), to take charge of the Royal Salop Infirmary Children's Unit (70 Beds), under the Consultant Pædiatrician. Vacant 12th October, 1953. The Unit consists of medical, surgical, and fever beds.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to the Group Secretary, Shrewsbury Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

22nd August, 1953. J. P. MALLETT, Group Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade). Post recognised under the conditions of the F.F.A.R.C.S. examination, and vacant 1st October, 1953.

Applications, stating age, nationality, qualifications, and previous experience, together with copies of recent testimonials, should be sent to the Group Secretary, Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Group Secretary.
Royal Salop Infirmary, Shrewsbury, 12th September, 1953.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. Sidcup AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædics). Salary £670 p.a. The post, which will be vacant from 1st October, 1953, offers good facilities for experience in this specialty and is recognised for the examinations of the Royal College of Surgeons. The Hospital is situated in pleasant surroundings and is within half-an-hour's travelling time of London.

Applications to the Secretary, Queen Mary's Hospital, Sidcup, Kent.

SKIPTON (near). MIDDLETON AND GRASSINGTON GROUP. THE HOSPITAL, GRASSINGTON, near SKIPTON. (208 Beds.) Applications are invited for appointment as HOUSE OFFICER at the above Hospital for tuberculosis. Salary in accordance with national scale (based on experience) £350–£670. Accommodation available.

Applications, stating age, qualifications and experience, together with names of 2 referees, to be addressed to the Secretary.

SLOUGH. UPTON HOSPITAL. Locum Anæsthetic REGISTRAR required 2nd October.

Applications, together with details of experience, should be addressed to the Hospital Secretary.

SLOUGH. UPTON HOSPITAL. North West Metro-POLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required at above Hospital. Post recognised for D.A. Approximately 60% of the duties will be performed at Upton Hospital and 40% shared between other hospitals in the Group. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Windsor Group Hospital Management Committee, Kipling Memorial Building, Alma-road, Windsor, by 28th September.

SLOUGH, BUCKS. UPTON HOSPITAL. Locum Senior HOUSE OFFICER (casualty) required approximately 21st September. Salary on national scale.

Applications, together with testimonials, should be made to the Hospital Secretary.

SLOUGH, BUCKS. UPTON HOSPITAL. House Surgeon required for post vacant 1st November. Preference will be given to persons seeking a pre-registration House Officer post under the Medical Act, 1950. Salary on national scale.

Applications should be sent to the Hospital Secretary.

SLOUGH, BUCKS. UPTON HOSPITAL. Senior House OFFICER (casualty) required immediately. Salary on national scale.

Applications, stating age, and qualifications, together with testimonials, should be sent to the Hospital Secretary.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON for a period of 6 months, from 28th October, 1953. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SOUTHAMPTON CHILDREN'S HOSPITAL. (Recognised by Conjoint Board for D.C.H.) HOUSE OFFICER required, post vacant 7th November, 1953. Salary, &c., as nationally advocated. Preference given to candidates intending to specialise in pædiatrics.

Applications, with copies of testimonials, to be submitted not later than 26th September, 1953, to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post tenable 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Chest Diseases to fill a vacancy in the approved trainee establishment at the Dartford group of hospitals. Duties will include both care of inpatients at Bow Arrow Hospital, Dartford, and clinic work. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis in adults. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 3rd October, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as a Whole-time REGISTRAR in Urology to fill a vacancy in the Canterbury group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 3rd October, 1953.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for a whole-time appointment as RESIDENT SURGICAL OFFICER to fill a vacancy in the approved establishment of the Hastings group of hospitals. The salary will be £890 p.a., and the appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance, renewable for a further year.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 3rd October, 1953.

SOUTHEND-ON-SEA GENERAL HOSPITAL. Resident CASUALTY OFFICER (Senior House Officer grade). Post vacant 1st October, 1953, and recognised for the F.R.C.S.

Applications, stating age, qualifications, and previous experience, with copies of recent testimonials, should reach the undersigned at the Hospital as soon as possible.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA HOSPITAL. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology) for duties within the units comprising the above Hospital. Post tenable for one year and recognised for the Diploma in Pathology. Previous experience in pathology not essential but applicants must have good clinical experience. Salary £670 p.a., less appropriate deduction for board.

Applications, with copies of at least 2 recent testimonials, should be sent to the undersigned as soon as possible.

J. C. FIELD, Secretary.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON (House Officer grade), vacant 1st October, 1953, for a period of 6 months for general surgical duties, and duties in the Casualty, Orthopædic and Fracture Departments.

Applications, stating age, qualifications and experience, with copies of 3 recent testimonials, to reach the undersigned as soon as possible. J. C. FIELD, Secretary.

STOCKPORT. STEPPING HILL HOSPITAL. (464 Beds.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer). Appointment to commence about 16th October, 1953. The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

7th September, 1953.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female. Recognised for D.A. Post now vacant. Duties mainly at the General Infirmary, Stafford, which is the main and acute general hospital of the Group.

Applications, with copies of 3 testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (pædiatrics). Post recognised for experience during pre-registration periods.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT GROUP OF HOSPITALS. Whole-time SENIOR REGISTRAR IN ORTHOPÆDICS. Transitional appointment. Duties at North Staffordshire Royal Infirmary, Hartshill Orthopædic Hospital and other group hospitals. Required for 1 year in the first instance with probable extention, but not beyond 31st December, 1955. Terms as recently agreed by the Ministry of Health and the profession. Applications invited from Senior Registrars in fourth or subsequent years, and from those who held such posts for 3 or more years but vacated them after 1st January, 1951.

Application forms from Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 5th October, 1953. Candidates may visit group hospitals.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (medical), pre-registration post.

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (orthopædics) required, vacant now. Post recognised for F.R.C.S.

Applications, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (gynæcology and obstetrics), pre-registration post.

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princess-road, Stoke-on-Trent.

SUTTON, SURREY. BANSTEAD HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital of 2400 Beds, which caters for all forms of nervous and mental disorder. The post offers an excellent opportunity for training in psychiatry and in particular in preparation for the D.P.M. for which courses of clinical instruction, including psychology are arranged. Accommodation is available for a single person at a moderate charge.

Applicants should apply to the Secretary, Banstead Hospital, Sutton, Surrey, for form of application, which should be returned, duly completed, within 14 days of the appearance of this advertisement.

SWANSEA. MORRISTON HOSPITAL. (450 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners, for the resident or non-resident appointment, which will become vacant on 1st November next, of SENIOR HOUSE OFFICER in the Department of Diseases of the Chest at the above Hospital. The Department consists of 82 Beds for diseases of the chest (63 beds for respiratory tuberculosis, 19 beds for non-tuberculous pulmonary cases). There are 4 weekly thoracic surgery operation sessions. Close liaison within the Hospital with the General Medical Unit and other Special Departments affords excellent experience.

Applications, stating age, qualifications and experience, should be addressed to the Medical Superintendent, Morriston Hospital, Swansea. O. C. HOWELLS, Group Secretary.

SWANSEA. MOUNT PLEASANT HOSPITAL. (276 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Female) for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, should be addressed to the undersigned.

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the posts (2) of RESIDENT ANÆSTHETISTS (Senior House Officer grade). The Hospital is recognised under the D.A. regulations.

Applications, stating age, qualifications and experience, should be addressed to— O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident post of SENIOR HOUSE OFFICER in the E.N.T. Department of the above Hospital. The Hospital is recognised under the regulations of the F.R.C.S. (E.N.T.) and the D.L.O.

Applications, stating age, qualifications and experience, should be forwarded to O. C. HOWELLS, Group Secretary.
St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the non-resident appointment of SENIOR HOUSE OFFICER in the Orthopædic Department of Swansea Hospital. The Hospital is recognised for Part II of the Diploma in Physical Medicine.

Applications, stating age, qualifications and experience, should be addressed to— O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
Swansea Hospital, St. Helen's-road, Swansea.

ST. ALBANS (near), HERTS. SHENLEY HOSPITAL. (2035 Beds, 16 miles from London.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER (psychiatric), resident or non-resident, for 1 year in the first instance, at above Hospital. Opportunity for work with neurotic as well as psychotic patients, and full facilities for D.P.M. training. The Hospital may be visited by appointment.

Applications to the Medical Superintendent, Shenley Hospital.

ST. ALBANS CITY HOSPITAL, St. Albans, Herts. (382 Beds.) Locum ANÆSTHETICS REGISTRAR required immediately for an indefinite period at the above Hospital.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to be addressed to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans.

ST. HELENS. ECCLESTON HALL HOSPITAL. (75 Beds.) Applications are invited from suitably qualified registered medical practitioners for the post of SENIOR HOUSE OFFICER at the above Hospital. Salary in accordance with the terms and conditions of service for medical staff. The person appointed will work under the supervision of the Consultant Chest Physician for the Group. There are 75 Beds and the work comprises all types of tuberculosis. Good residential accommodation for a single person, male or female, is available.

Applications to be forwarded to the undersigned immediately.

N. RICHARDS, Secretary,
St. Helens and District Hospital Management Committee.
Group Office, County Hospital, Whiston, near Prescot.

TAPLOW, near MAIDENHEAD, BERKS. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 4th November. Salary on national scale. Preference will be given to persons seeking a pre-registration House Officer post under the Medical Act, 1950.

Applications, stating age, experience and qualifications, with dates, together with copies of 2 testimonials, should be forwarded to the Hospital Secretary by 25th September.

TRURO. ROYAL CORNWALL INFIRMARY. (212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the combined pre-registration post of HOUSE SURGEON (E.N.T. and Ophthalmic Departments) and JUNIOR HOUSE PHYSICIAN, vacant 4th November, 1953.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to the Hospital Secretary.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the 2 posts of SENIOR RESIDENT HOUSE OFFICER to the Orthopædic and Traumatic Department. This is a large and busy centralised unit with 2 Consultants, 64 Beds, and Outpatient Departments also 45-Bed Rehabilitation Annexe which deal with the whole of the West Cornwall Area. The posts are now vacant, and are tenable for 1 year.

Applications, stating age, nationality, qualifications and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Hospital Secretary, Royal Cornwall Infirmary, Truro, without delay.

TRURO. ROYAL CORNWALL INFIRMARY. (212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the newly created office of SENIOR HOUSE OFFICER (Pathological Department).

Applications, stating age, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be sent to the Hospital Secretary, Royal Cornwall Infirmary, Truro.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer status), which falls vacant on 6th November, 1953. Post tenable for 1 year.

Applications, stating age, nationality, qualifications and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Hospital Secretary, Royal Cornwall Infirmary, Truro.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE OFFICER (medical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER, resident, unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, should be sent to Physician-Superintendent.

WORKSOP. KILTON HOSPITAL. Sheffield Regional HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 28th September, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.) HOSPITAL MANAGEMENT COMMITTEE NO. 9 WAKEFIELD A GROUP. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade) £670 p.a. The Hospital is recognised for the F.R.C.S. (Eng.), and the post offers excellent experience in general surgery.

Applications should be made to the undersigned immediately.

W. READ, Group Secretary.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited for :—

(*a*) Locum SENIOR HOUSE SURGEON (general surgery) for month of October. Salary £13 per week, less a deduction of £2 10s. per week for board, lodging, &c.

(*b*) Locum HOUSE SURGEON (gynæcology and general surgery). Salary £8 per week, less a deduction of £1 18s. 4d. for board, lodging, &c.

Address written applications with full particulars to :—

G. L. BANNER, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WAKEFIELD. THE GENERAL HOSPITAL, Park Lodge-lane, WAKEFIELD. (160 Beds.) HOSPITAL MANAGEMENT COMMITTEE NO. 9 WAKEFIELD A GROUP. Applications are invited for the appointment of a SENIOR HOUSE OFFICER in General Surgery at the above Hospital. Terms and conditions of service are in accordance with the National Health Service Act and regulations thereunder.

Applications should be made to the Group Secretary, Clayton Hospital, Wakefield.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female) at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Senior House Officer, and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—

H. L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Salary will be £350–£450 p.a., less a deduction of £100 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Resident Casualty Officer). The commencing salary is in accordance with the scale £700–£50–£1000, less a deduction of £130 for residential emoluments.

Applications, stating age, experience, and qualifications, should be sent to—

H. L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancs.

WHITEHAVEN HOSPITAL, Cumberland. (109 Beds and Annexe of 19 Beds.) HOUSE SURGEON for Orthopædic and Casualty Departments (House Officer or Senior House Officer grade), vacant now.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is an approved pre-registration House Officer post. Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,

Powys and Mawddach Hospital Management Committee.

Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM. MAELOR GENERAL HOSPITAL. (517 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of PÆDIATRIC HOUSE PHYSICIAN to commence duties immediately at the above Hospital. Duties at the Pædiatric Unit (50 Beds and cubicles) will be under the supervision of the Consultant Pædiatrician.

Applicants should apply, enclosing 2 recent testimonials, to—

WILLIAM JONES, Secretary, Wrexham,

Powys and Mawddach Hospital Management Committee.

Maelor General Hospital, Wrexham.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.

HOUSE OFFICER (Casualty Department), vacant now.

HOUSE OFFICER (Ear, Throat and Nose Department), vacant shortly.

Women's Hospital, Wolverhampton

HOUSE OFFICER (gynæcological and obstetric), vacant 5th October. Appointment recognised for M.R.C.O.G.

Wolverhampton and Midland Counties Eye Infirmary

HOUSE OFFICER, vacant now. Appointment recognised for F.R.C.S. and D.O. examinations.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.

The Royal Hospital, Wolverhampton.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the University of Birmingham Medical School.) WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION. Applications are invited for the appointment of a JUNIOR HOSPITAL MEDICAL OFFICER in Pathology at The Royal Hospital, Wolverhampton. Salary £700–£50(6)–£1000 p.a. Resident or non-resident. Post vacant 1st November, 1953.

Applications, naming 3 referees, should be addressed to—

W. COCKBURN, Secretary.

The Royal Hospital, Wolverhampton.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the Rhymney and Sirhowy Valleys Hospital Management Committee. The successful candidate will be based at the Caerphilly and District Miners' Hospital, Caerphilly, Glam, and will also be expected to serve other hospitals within the Committee's Area. The post is resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the Glantawe Hospital Management Committee. The successful candidate will be based at Morriston Hospital, Morriston, near Swansea. The post is non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (311 Beds.) HOUSE OFFICER (gynæcology) required, vacant immediately. The Hospital is recognised by the Royal College.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required immediately. Resident. Post recognised for F.R.C.S. Wide experience available under Area orthopædic team. Appointment for 6 months in the first instance.

Applications, with copies of 2 testimonials, to the Secretary.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. (221 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SURGICAL HOUSE OFFICER (Senior House Officer grade). The post is recognised for the revised Fellowship regulations in respect of the 6 months training required by candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality, and experience, together with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary, as soon as possible.

A. V. OAKTON, Group Secretary.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE-MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (218 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer). Recognised for F.R.C.S. Vacant now.

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

East Riding General Hospital, Driffield, Yorks (249 Beds)

(*c*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties.

(*d*) HOUSE PHYSICIAN (first, second, or third post), vacant early October. Pre-registration post. Duties include medical and chronic wards, casualty and some anæsthetics and midwifery. Good general experience for first house appointment.

Northfield Sanatorium, Driffield, Yorks (78 Beds)

(*e*) HOUSE PHYSICIAN (first, second, or third post). General Sanatorium treatment. Provision may be made available for thoracic surgery, pathological experience, and M.M.R. Unit. Time for study.

Salary for (*a*) is £670 p.a., less £140 for board and lodging ; and for (*b*), (*c*), (*d*), and (*e*) £350–£450 p.a., less £100 for board and lodging. Fully qualified practitioners may also apply for the pre-registration posts.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorkshire.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a whole-time post as REGISTRAR or SENIOR HOUSE OFFICER in Dental Surgery at hospitals managed by the Belfast Hospital Management Committee. The appointment may be as Senior House Officer or Senior or Principal Registrar, the analogous grades in Great Britain being Senior House Officer, Registrar, and Senior Registrar respectively.

Application should be made on a form, which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and which must be returned so as to be received not later than 10th October, 1953.

CHANNEL ISLANDS. JERSEY GENERAL HOSPITAL. Applications are invited for the post of CASUALTY OFFICER which will be vacant on 1st December, 1953, in the above Hospital. The appointment is for 6 months but is renewable for a further 6 months. Salary £400 p.a., less £100 for residential emoluments.

Applications to be submitted not later than 10th October, 1953, to— The President, Public Health Committee.

General Hospital, Jersey, Channel Islands.

WORKINGTON INFIRMARY, Cumberland. (86 Beds, plus Annexe 34 Beds, pre-registration post, recognised F.R.C.S. (Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post), vacant now.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

Public Appointments

BOARD OF CONTROL. Whole-time Senior Clinical PSYCHOLOGIST at Rampton Hospital, near Retford, Notts (1143 Beds), for patients exhibiting conduct disorders with mental deficiency. Considerable scope for research. Post is resident or non-resident. Single quarters for a Female applicant or house on the estate for a married applicant will be available at appropriate charges. Appointment will be on National Health Service conditions and subject to National Health Service superannuation regulations. Salary scale, £845–£1170.

Applications, giving full particulars of qualifications and experience to Medical Superintendent not later than 30th September.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. Applications are invited from registered medical practitioners for the whole-time superannuable post of ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. Salary £850 p.a. by annual increments of £50 to £1150 p.a., plus a car allowance.

Particulars and application forms are obtainable from Dr. J. B. S. MORGAN, County Medical Officer, County Offices, St. Mary's Gate, Derby.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
PENSHURST	KENT ..	3RD OCTOBER, 1953

KAMPALA MUNICIPAL COUNCIL. Uganda Protectorate. Applications are invited for the appointment of MEDICAL OFFICER OF HEALTH in the salary scale £1650–£50–£1800. A temporary allowance at the rate of £300 p.a. is also paid. The successful candidate must possess a Diploma in Public Health and have had experience as a Medical Officer in Government or Local Government service, preferably in a tropical country. Council operate a Provident Fund into which the Officer contributes 5% of salary and the Council 7½% of salary. A superannuation scheme is at present being discussed. The appointment carries overseas leave and passage privileges after a tour of 30–36 months at the rate of 5 days leave for each completed month of resident service. The appointment is subject to the Council's Staff regulations and terms of service and to the approval of His Excellency the Governor of Uganda.

Applications, stating age, qualifications, previous experience, and copies of testimonials or the names of referees, should be received by the undersigned not later than 12th October, 1953. Canvassing of members of the Council, directly or indirectly, in connection with this appointment will disqualify the candidate. K. EVANS, Town Clerk.

Municipal Offices, P.O. Box 210, Kampala, Uganda.

HER MAJESTY'S COLONIAL SERVICE. Nigeria. Applications are invited from Doctors with medical qualifications registrable in the United Kingdom and with at least 1 years experience after qualification for the following posts in the Medical Department of the Government of Nigeria :—

(*a*) MEDICAL OFFICERS, for general duties in preventive and curative medicine which may include purely rural health work, involving much travelling.

(*b*) MEDICAL OFFICERS OF HEALTH. Duties as under (*a*). In addition the selected Officers would undertake the control of sanitary matters, and may be required to perform the duties of Port Health Officer at a sea or air port. Candidates should possess a Diploma in Public Health. A Diploma in Tropical Hygiene, though not essential, is desirable.

Appointments may be made as follows :—

(*a*) on 3 years probation for permanent and pensionable employment in the Colonial Medical Service, with retiring age of between 45 and 55. Pensions are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service ;

(*b*) from the National Health Service. Candidates may resign from the National Health Service but retain their superannuation rights during their time in Nigeria (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving Nigeria at the end of their engagement ; or

(*c*) on short-term contract (2–4 tours of 18 months duration) with inclusive salary of from £1087 p.a. rising to £2000 p.a. ; on completion of contract a gratuity is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Salaries, including pensionable expatriation pay for Officers appointed under (*a*) or (*b*) range from £950 to £1850 p.a. Starting salary in all cases depends on experience and war service. Quarters are provided at low rents. Free passages in both directions are provided for Officer and his wife. Payment of the cost actually incurred on 1 outward and 1 homeward passage for each of 2 children under age of 18, subject to maximum of £75 in respect of the return journey for each child, is also granted. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18 months duration.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/14/01).

HER MAJESTY'S COLONIAL SERVICE. Bechuanaland PROTECTORATE. Applications are invited from medical practitioners with qualifications registrable in the United Kingdom or in the Union of South Africa, for appointment as MEDICAL OFFICERS in the Bechuanaland Protectorate. Appointments will be on 2 years probation for permanent and pensionable employment. Salary scale £865–£1320 p.a. and a cost-of-living allowance of £105–£132 p.a. is also payable to married men and half that amount to single men. Private practice is permitted at the discretion of the Director of Medical Services. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in Bechuanaland (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Bechuanaland salary on leaving the territory at the end of their engagement. Doctors appointed from the National Health Service may be considered for permanent terms at any time provided they surrender their rights to the resettlement grant and payment by Bechuanaland of superannuation contributions. Quarters are provided at rental of 10% of salary. Local leave is permissible and generous home leave is granted after each tour of 3–4 years. Free passages provided for officer and wife, and assisted passages for children.

Application forms can be obtained from the Director of Recruitment (Colonial Service) Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/76/02).

KINGSTON UPON HULL CORPORATION. HEALTH DEPARTMENT. Applications are invited from registered medical practitioners of either sex for the appointment of ASSISTANT MEDICAL OFFICER. Under the Corporation's scheme for the interavailability of Medical Officers, the post involves duties in the School Health Service, the Maternity and Child Welfare Section, and other Local Health Authority's Services and, in the event of the appointment of a Male officer, duties under the Hull and Goole Port Health Authority. The salary scale is £950 p.a., rising by annual increments of £50 to £1300 p.a., and regard will be paid to previous service in the grade in fixing the commencing salary. The possession of a qualification in Public Health or the D.C.H. will be an advantage, and preference will be given to candidates who are approved by the Ministry of Education for the purpose of ascertainment of educationally subnormal pupils.

Forms of application and schedules of conditions may be obtained from the Medical Officer of Health, Guildhall, Kingston upon Hull, to whom the completed application forms should be returned not later than Monday, 12th October, 1953.

MANCHESTER. CITY OF MANCHESTER HEALTH DEPARTMENT. MEDICAL OFFICER, Maternity and Child Welfare. Applications are invited from registered medical practitioners (Men or Women) for the above position on the permanent staff. Applicants should have obstetric and/or paediatric experience and will be required to undertake duties principally in maternity and child welfare clinics. Possession of the D.Obst.R.C.O.G. or D.C.H. qualification will be an advantage. Salary scale £950 rising to £1300 p.a. The appointment is subject to a medical examination, and the City Council's conditions of service.

Application forms, obtainable on request, must be returned in an envelope marked "Medical Officer, M. & C.W." to the Town Clerk, Town Hall, Manchester, 2, and not to any member of the Council, within 21 days of this advertisement. Canvassing is prohibited.

NEW SOUTH WALES DEPARTMENT OF PUBLIC HEALTH, AUSTRALIA. MEDICAL OFFICER OF HEALTH. Salary £A1762 annually. The duties of the position entail the supervision and coördination of public health activities within the Richmond-Tweed Health District. Headquarters located at Lismore, N.S.W., where residence is available at reasonable rental. Applicants should possess the Diploma of Public Health or similar qualifications. Previous experience in the field of public health is desirable. Appointee will be eligible, subject to medical examination, to contribute to the New South Wales superannuation fund, which will provide an annual pension of up to £A1014. The first-class shipping fare to Sydney of the appointee and his family will be paid.

Applications (6 copies) (together with 6 copies of testimonials and other supporting documents), should reach the Agent-General for New South Wales, 56/57, Strand, London, W.C.2, by 19th October, 1953. No special forms of application are available.

NOTTINGHAM. CITY OF NOTTINGHAM EDUCA- TION COMMITTEE. Applications are invited from registered medical practitioners with not less than 3 years experience since qualifying for appointment as Whole-time ASSISTANT SCHOOL MEDICAL OFFICER. Salary in accordance with national scale.

Applications, stating age, qualifications and experience, and the names of 3 referees, should be sent to Dr. A. A. E. Newth, 28, Chaucer-street, Nottingham.

F. STEPHENSON, Director of Education.

YORKSHIRE. COUNTY OF THE WEST RIDING OF YORKSHIRE. The County Council of the West Riding of Yorkshire invite applications for the appointment of MEDICAL OFFICER OF HEALTH for the County. The salary will be £2900 p.a. rising by 3 increments of £100 and 1 of £50 to £3250 p.a. Candidates must not only be duly qualified as prescribed by the Local Government Act, 1933, but must also possess considerable administrative ability and a wide knowledge and experience of the organisation of public-health services.

The prescribed form of application with terms and conditions of the appointment may be obtained from the undersigned. Applications on the form provided, together with copies of not more than 3 recent testimonials, should be sent marked "Confidential," not later than 24th October, 1953, addressed to the Clerk of the County Council, County Hall, Wakefield. Canvassing, directly or indirectly, will be a disqualification.

BERNARD KENYON, Clerk of the County Council.

County Hall, Wakefield, September, 1953.

STAFFORDSHIRE COUNTY COUNCIL. Appointment of ASSISTANT MEDICAL OFFICERS. Applications are invited from fully qualified medical practitioners for the above-mentioned appointments, and those holding the Diploma of Public Health will be given preference. The candidates appointed will undertake clinical work in the School Health and Child Welfare Services under the direction of the County Medical Officer of Health and will be required to perform such other duties as may from time to time be prescribed. The salary scale is £950 p.a. rising by annual increments of £50 to a maximum of £1300 p.a., and previous similar service may be taken into consideration when deciding the commencing rate. Each selected candidate may be required to provide a motor-car, for which allowances will be paid in accordance with the County Council scale. A lodging allowance of 25s. per week and return railway fare home every 2 months will be paid for a maximum period of 6 months where the successful candidate is married and has to continue to maintain a home outside the geographical County while seeking house accommodation. Each appointment will be terminable by 1 months notice in writing on either side and subject to the provisions of the appropriate Superannuation Acts and Regulations, in which connection the selected candidates must pass a medical examination and submit their birth certificates.

Forms of application may be obtained from the undersigned and should be returned to the County Medical Officer of Health, County Buildings, Stafford, not later than 9th October, 1953, together with copies of not more than 3 recent testimonials.

T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford, 10th September, 1953.

NATIONAL HEALTH INSTITUTE, NEW ZEALAND. Applications are invited from suitably qualified persons to fill the undermentioned vacancies at the National Health Institute, Wellington, New Zealand. The functions of the Institute, which is commencing operations shortly, will include routine and research work in public health bacteriology, and the training of non-medical public health personnel.

CHIEF TECHNOLOGIST. Applicants should be Fellows of the Institute of Medical and Laboratory Technology or possess an equivalent qualification. Experience in public-health bacteriology rather than clinical pathology and bacteriology is desirable. Salary : £835 N.Z. to £1008 N.Z. p.a. or £950 N.Z. to £1123 N.Z. p.a., according to qualifications and experience.

ASSISTANT TECHNOLOGISTS. 2 vacancies. Applicants should be Associates of the Institute of Medical and Laboratory Technology or possess equivalent qualifications. Salary : £605 N.Z. to £749 N.Z. p.a., according to qualifications and experience.

Application forms and conditions of service may be obtained on request from The High Commissioner for New Zealand, 415, Strand, London, W.C.2, mentioning this journal and quoting reference No. A.16/195/48. Completed applications to be lodged in London not later than Friday, 16th October, 1953.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

EDMONTON. Applications invited for Vacancy. Previously conducted by lady doctor. List at present approximately 3200. Residence and surgery may be available. Apply on E.C.16A before 26th September, 1953, to—

F. J. ASHFORD, Middlesex Executive Council.

Gloucester House, Gloucester Gate, London, N.W.1.

KINGSTON UPON HULL, YORKS. Applications invited for VACANCY in urban area classified "designated." List at present approximately 3650. Surgery accommodation may be available. Apply on E.C.16A, before 30th September, 1953, to the Clerk, National Health Service Executive Council, 52, Ferensway, Hull, Yorks.

LITTLE LONDON, near BASINGSTOKE, HAMPSHIRE. Applications invited for VACANCY (rural) due to resignation of elderly practitioner. List at present approximately 1200, practically all dispensing. Residence and main surgery not available. Apply, on Form E.C.16A, before 3rd October, 1953, to—

F. STEED, Clerk of the Hampshire Executive Council.

37, Southgate-street, Winchester.

WHITLEY BAY, NORTHUMBERLAND. Applications invited for a resignation VACANCY (urban). Practice premises not available. List at present approximately 4900. Applications on Form E.C.16A to reach the undersigned not later than 22nd September, 1953.

J. B. SMITH, Clerk, Northumberland Executive Council.

10, Ellison-place, Newcastle upon Tyne, 1.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Medical Officer required for Borneo Abaca Ltd. in early 1954 for large rubber/hemp estates in Borneo. Experience of medicine and hygiene in tropical climates, particularly for native labour, preferably having Diploma Tropical Medicine and Hygiene. Salary £1250–£1500 according to qualifications and experience, plus allowances with free house and hard furniture. Overseas tour of 3 years followed by 6 months leave on full pay between tours. Free passages. Contributory pension scheme.—Apply to Personnel, Colonial Development Corporation, 33, Hill-street, giving full particulars quoting Serial 187.

Medical Officer required for Middle East by large Oil Company ; preference for those with overseas experience and some knowledge of tropical work. Age about 35 and preferably single. Emoluments total over £2000 p.a ; paid home leave after 2 years ; pension fund.—Write, quoting No. 379 to Box No. 7028, c/o CHARLES BARKER & SONS LTD., 31, Budge-row, London, E.C.4.

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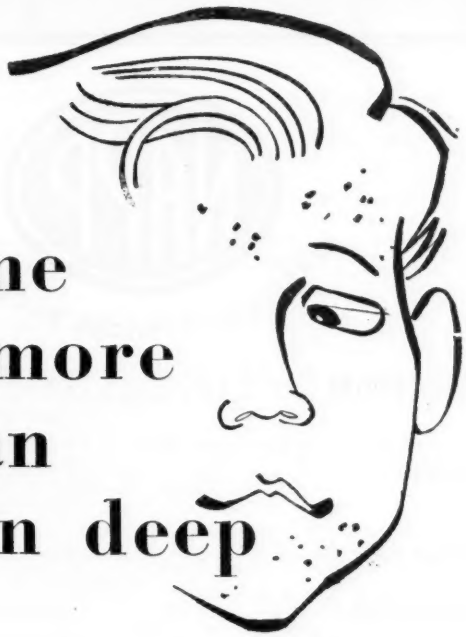

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